

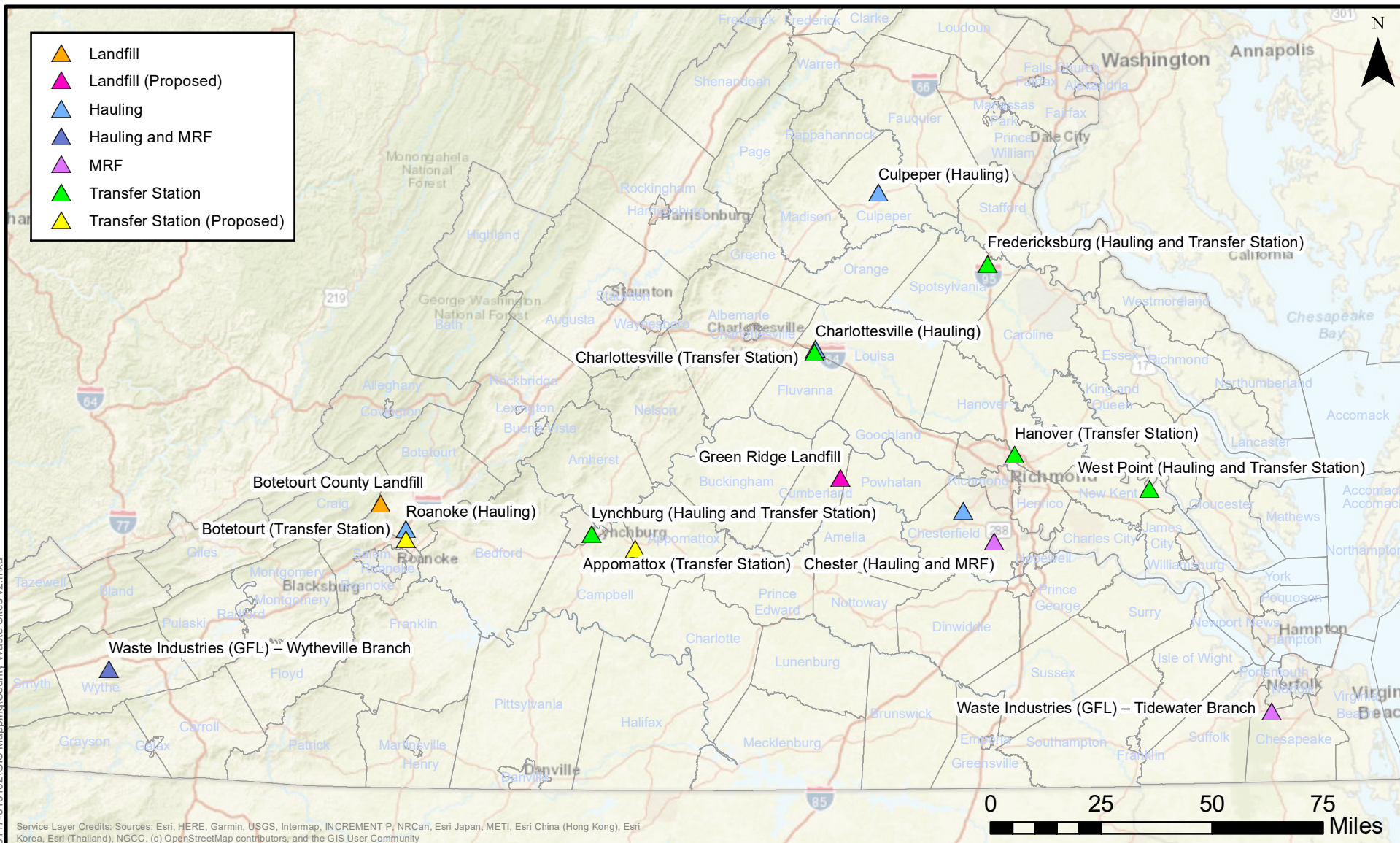
ATTACHMENT 5

FIGURE 1

COUNTY WASTE / GFL WASTE OPERATIONS IN VIRGINIA

DATED OCTOBER 27, 2020

Path: P:\2018\180201001\18020117\18020117-010102\GIS Mapping\County Waste Sites v2.mxd



County Waste/GFL Waste Operations in Virginia

Green Ridge Recycling and Disposal Facility
Cumberland County, Virginia



Draper Aden Associates

Engineering • Surveying • Environmental Services

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Virginia Beach, VA

DESIGNED: LPK
DRAWN: SMF
CHECKED: LPK
DATE: 10-27-20

SCALE: 1:2,000,000

PROJECT: 18020117-010102

FIGURE

1

ATTACHMENT 6

***STANDARD DEMOGRAPHICS FOR THE AREAS AROUND THE GREEN RIDGE
PROJECT IN CUMBERLAND COUNTY, VIRGINIA***

DATED JUNE 6, 2020

***ADDENDUM - STANDARD DEMOGRAPHICS FOR THE AREAS AROUND THE
GREEN RIDGE PROJECT IN CUMBERLAND COUNTY, VIRGINIA***

DATED AUGUST 6, 2020

JUNE 16, 2020



GREEN RIDGE

RECYCLING AND DISPOSAL FACILITY

STANDARD DEMOGRAPHICS FOR THE AREAS AROUND THE GREEN RIDGE PROJECT IN CUMBERLAND COUNTY, VIRGINIA

PREPARED BY



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MANGUMECONOMICS.COM





About Mangum Economics, LLC

Mangum Economics, LLC is a Richmond, Virginia based firm that specializes in producing objective economic, quantitative, and qualitative analysis in support of strategic decision making. Much of our recent work relates to Renewable Energy (solar and wind), IT & Telecom Infrastructure (data centers, terrestrial and subsea fiber), and Economic Development. Examples of typical studies include:

POLICY ANALYSIS

Identify the intended and, more importantly, unintended consequences of proposed legislation and other policy initiatives.

ECONOMIC IMPACT ASSESSMENTS AND RETURN ON INVESTMENT ANALYSES

Measure the economic contribution that businesses and other enterprises make to their localities.

WORKFORCE ANALYSIS

Project the demand for, and supply of, qualified workers.

CLUSTER ANALYSIS

Use occupation and industry clusters to illuminate regional workforce and industry strengths and identify connections between the two.

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Researcher and Economic Development Specialist



Executive Summary

This report provides demographic data on the areas immediately surrounding the proposed Green Ridge Recycling and Disposal Facility in Cumberland County, Virginia. We compared data on areas within a 1-mile, 2.2-mile, 4.2 mile, and 6.2-mile radius of the facility to demographic data for Cumberland and Powhatan Counties, and Virginia statewide data. Our approach is consistent with guidance from the US Environmental Protection Agency on collecting data for environmental justice issues. We used high quality data from the US Census Bureau and data from a widely used demographics firm.

We found that there are more than 5 times as many people per square mile living in the state of Virginia overall than there are living within 6.2 miles of the facility. That means that the location of the proposed facility is in one of the least densely populated areas in the state. Overall, the percentage of racial minorities living within 6.2 miles of the proposed facility is about the same as the percentage living within the state of Virginia. And the median household income of people living within 6.2 miles of proposed facility is more than 30 percent higher than in rural Virginia, overall (\$52,948 vs \$40,153).

Based on high-quality census data, the area within 6.2 miles of the proposed Green Ridge Recycling and Disposal Facility in Cumberland County has a minority concentration that mirrors that of the overall state of Virginia and that is lower than Cumberland County. People living within 6.2 miles of Green Ridge have a higher median household income than people living in Cumberland County overall and higher than people living in the rural localities in Virginia overall.

The area within 6.2 miles of the proposed Green Ridge facility would appear to be suitable for a facility that is best suited to an area with a low population density. Given that Cumberland County currently and for at least the last several years has a higher unemployment rate than neighboring Powhatan County and the state of Virginia as a whole, the facility would also be suitable to provide jobs for local residents and reliable tax revenue for Cumberland County.



Background

Woods Rogers PLC retained Mangum Economics for a demographics assessment of the area around the proposed Green Ridge Recycling and Disposal Facility, LLC (“Green Ridge”) in Cumberland County, Virginia.

THE PROPOSED GREEN RIDGE RECYCLING AND DISPOSAL FACILITY

Green Ridge is a proposed recycling and waste management facility in Cumberland County, Virginia. As reflected in Figure 1, Green Ridge would be located in Cumberland County just west of the boundary between Cumberland and Powhatan counties and just north of US Highway 60. The entire facility would occupy a total of 1,200 acres, including a recycling center and an approximately 240-acre disposal area. Green Ridge has been designed to minimize the impact on the surrounding area. According to Green Ridge, only 37 homes are located within one-half mile of the disposal area.

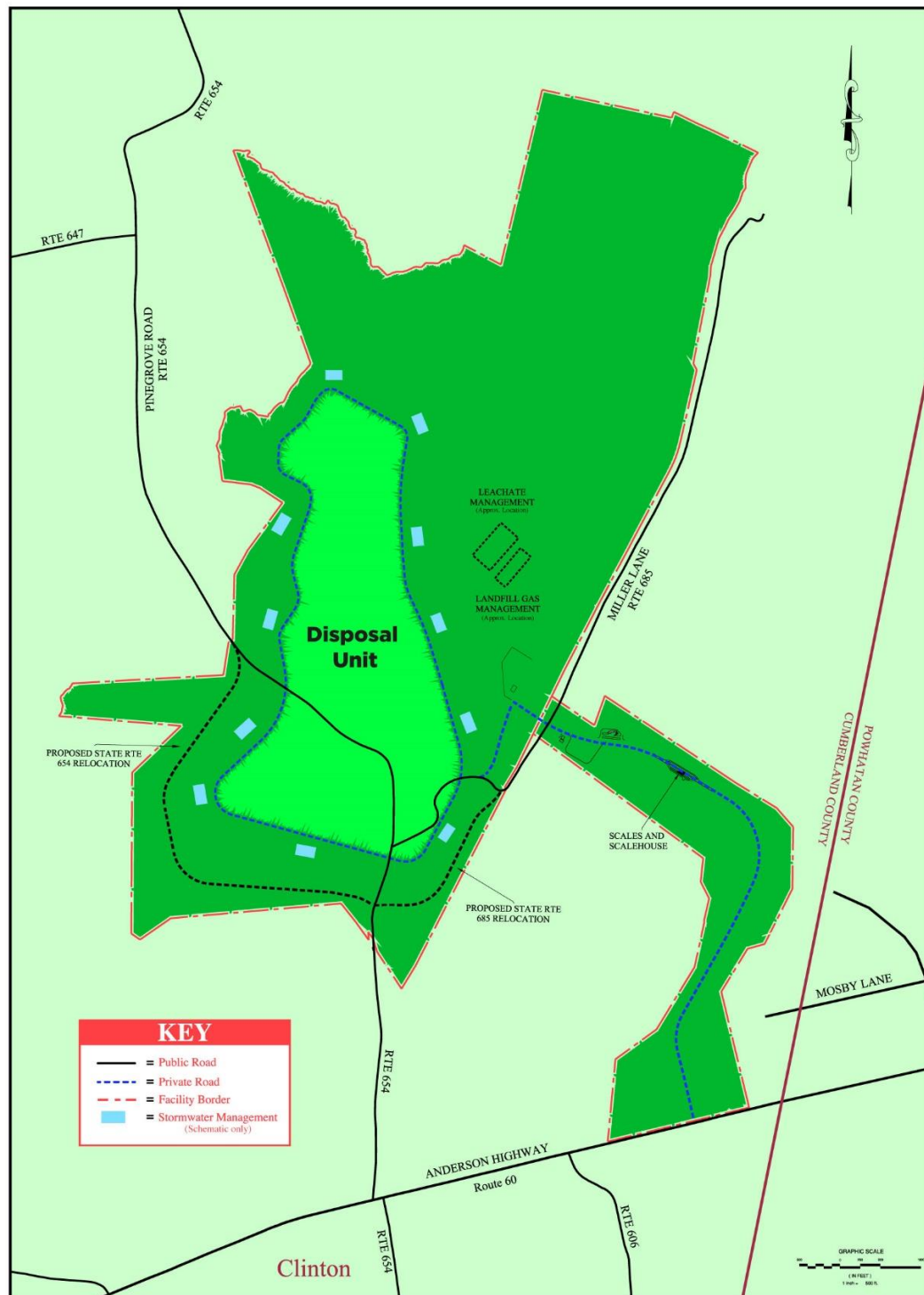
The facility is planned to have, at a minimum, 200-foot wide buffers between properties that are adjacent to the facility and the facility perimeter (with the exception of the entrance road). In order to minimize any odor from the facility, it will not accept wastewater treatment sludge or reprocessed sheetrock. The facility will have operating procedures to reduce noise, dust, and light coming from it.

Access to the facility will be by a new private mile-long road connecting to US Highway 60. To minimize the impact of traffic in the area, traffic flow will be controlled around the facility, and Green Ridge will use rumble strips to keep mud off of nearby roadways.

Figure 1 shows the conceptual design of the facility and its general location.



Figure 1. Conceptual Drawing of the Proposed Green Ridge Recycling and Disposal Facility¹



¹ This figure is a schematic and not meant to portray all landfill support operations. Final design will be completed later in the permitting process. <https://greenridgeva.com/project-description.html>



DEMOGRAPHIC DATA SOURCES

For this demographic assessment, we used methods consistent with guidance from the US Environmental Protection Agency (EPA) on environmental justice issues included in its *Toolkit for Assessing Potential Allegations of Environmental Injustice*.² EPA advises the following criteria be applied when collecting and reporting statistics used for environmental justice purposes.³

1. Criterion 1: Policy Relevance -- Each Environmental Justice Indicator should:
 - Provide a representative picture of the conditions within a community, pressures on the community, and the government's responses to those pressures;
 - Provide a basis for comparison between various geographic units of analyses: states, cities, counties, census blocks, or census tracts;
 - Be applicable to local and regional environmental and/or public health issues of national significance;
 - Have a threshold or reference value against which to compare it, so that users are able to assess the significance of the values associated with it; and
 - Be simple, easy to interpret, and able to show trends over time.
2. Criterion 2: Analytical Soundness -- Each Environmental Justice Indicator should:
 - Be well-founded in technical, empirical, theoretical, and scientific terms;
 - Be based on national standards and consensus about its validity as a measuring tool;
 - Lend itself to being linked to computer modeling and forecasting; and
 - Lend itself to being incorporated into data information systems.
3. Criterion 3: Measurability -- The data required to support each Environmental Justice Indicator should be:
 - Quantifiable, verifiable, and time-specific;
 - Readily available or made available at a reasonable cost/benefit ratio;
 - Adequately documented and of known quantity; and
 - Updated at regular intervals in accordance with reliable research procedures.

Demographic data from the US Census Bureau and demographic statistics based on the data provided by it meet all of those criteria. The Census Bureau is one of the agencies of the U.S. Federal Statistical System that produces data about Americans. The decennial census counts every person living in the United States using mail, phone, web-based, and door-to-door survey methods. The Bureau's annual American Community Survey is the premier source for detailed population and housing information in the United States. It is an ongoing survey that is conducted every month of every year sent to about 2 percent of the mailing addresses in the country. The survey collects information on many topics including, population, race, education, occupation, and housing.

² US Environmental Protection Agency, *Toolkit for Assessing Potential Allegations of Environmental Injustice*. November 2004.

³ US Environmental Protection Agency, *Toolkit for Assessing Potential Allegations of Environmental Injustice*. p. 27.



Information provided by the US Census Bureau is subject to the accuracy and reliability standards of the Information Quality Act. The Bureau meets a high standard of scientific integrity by following a common set of professional standards and operational practices designed to ensure the quality, integrity, and credibility of the data that it collects and reports. The Bureau also follows the guidance of the National Research Council of the National Academies on principles and practices necessary for federal agencies to produce statistical data that is relevant, credible, trustworthy, and independent of political influence. Since 2002, the Bureau has had an established procedure to allow anyone to seek correction of any of the information that it puts out.

Except where specifically noted, all of the information in this report for the years 2012 through 2017 is taken from the decennial census or the American Community Survey of the US Census Bureau.

We also report demographic data for 2018 and 2019, in order to provide the most up-to-date demographic estimates available. Data from the 2018 and 2019 American Community Survey has not yet been released by the US Census Bureau. For those years, we use data from the demographics firm, GeoLytics.

Since 1996, GeoLytics has published detailed demographic and geographic data based on data from the US Census Bureau. The company is a leading provider of census, demographic, and geographic data for academic and business researchers working in libraries, real estate, insurance, healthcare, in hundreds of universities across the country, and in federal, state, and local governments. GeoLytics makes estimates and projections of demographic statistics up to the most recent full calendar year based on the data from the US Census Bureau's most recent decennial census (2010) and data from all of the American Community surveys from that decennial census to the results most recently released in 2018 for the year 2017. Estimates and projections are based on complex modeling systems designed to forecast the current composition of the U.S. population, based on multiple inputs. The GeoLytics data also allows researchers to estimate demographic statistics within a given radius from a geographic point.

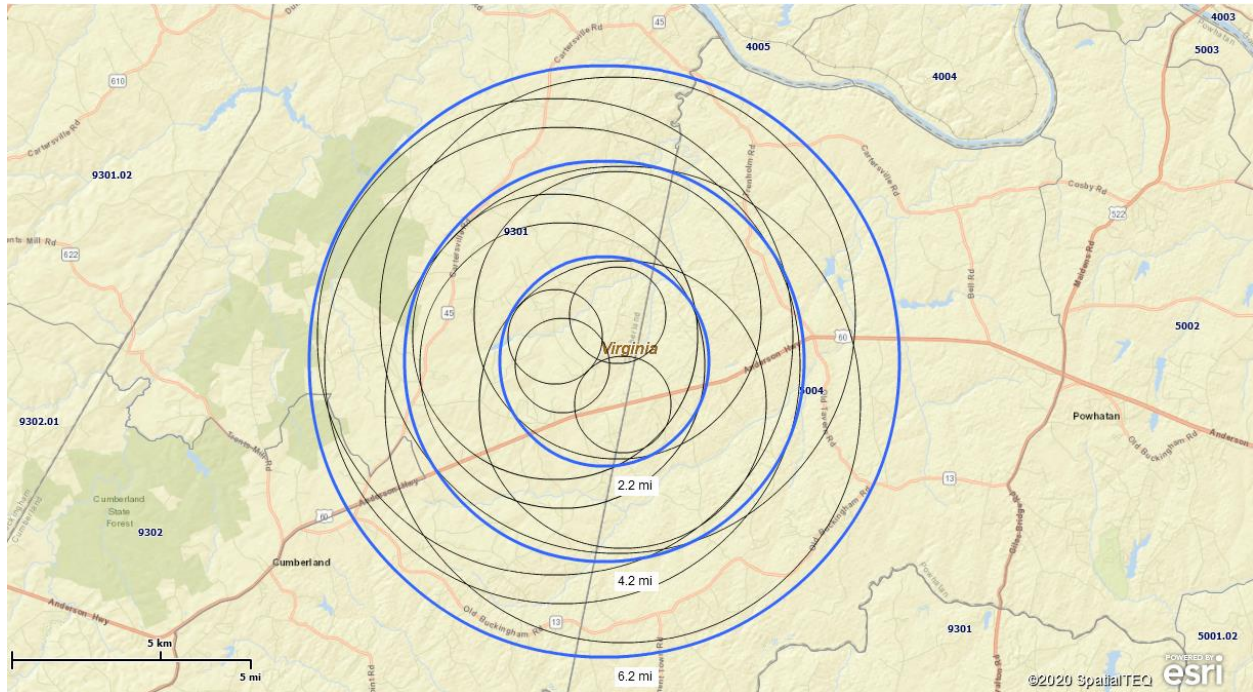
THE AREAS OF STUDY

In this report, we provide demographic statistics for areas 1-mile, 3-miles, and 5-miles out from the general edges of the Green Ridge facility property. For comparison, we also provide the same data for the counties of Cumberland and Powhatan, Virginia; and for the state of Virginia as a whole.

Because of the size of the Green Ridge facility, a circle with a 1-mile radius around the center of the facility would not include all residents living one mile or less from the property's boundary. Therefore, in addition to analyzing the demographics within a 1-mile radius of the approximate center of the facility, we also marked circles with a 1-mile radius from the general area of the 4 corners of the facility. Then, using a point nearest the center of the intersection of those 1-mile radius circles we marked a circle that would encompass all of them completely. The radius of that circle was 2.2 miles. We did the same for 3-mile and 5-mile radius circles at the corners of the facility. The circles that encompassed those circles had 4.2-mile and 6.2-mile radii. In this way, all of the people living within 1, 3, and 5 miles of the nearest

part of the facility are included in our demographic statistics. The people within these circles are the most affected by the proposed facility. Figure 2 illustrates the 1-mile, 3-mile, and 5-mile radius circles centered at the four corners of the facility boundary (in black) as well as the 2.2-mile, 4.2-mile, and 6.2-mile radius circles centered from the approximate center of the facility (in blue).

Figure 2. Identification of Areas Most Affected by the Proposed Green Ridge Facility⁴

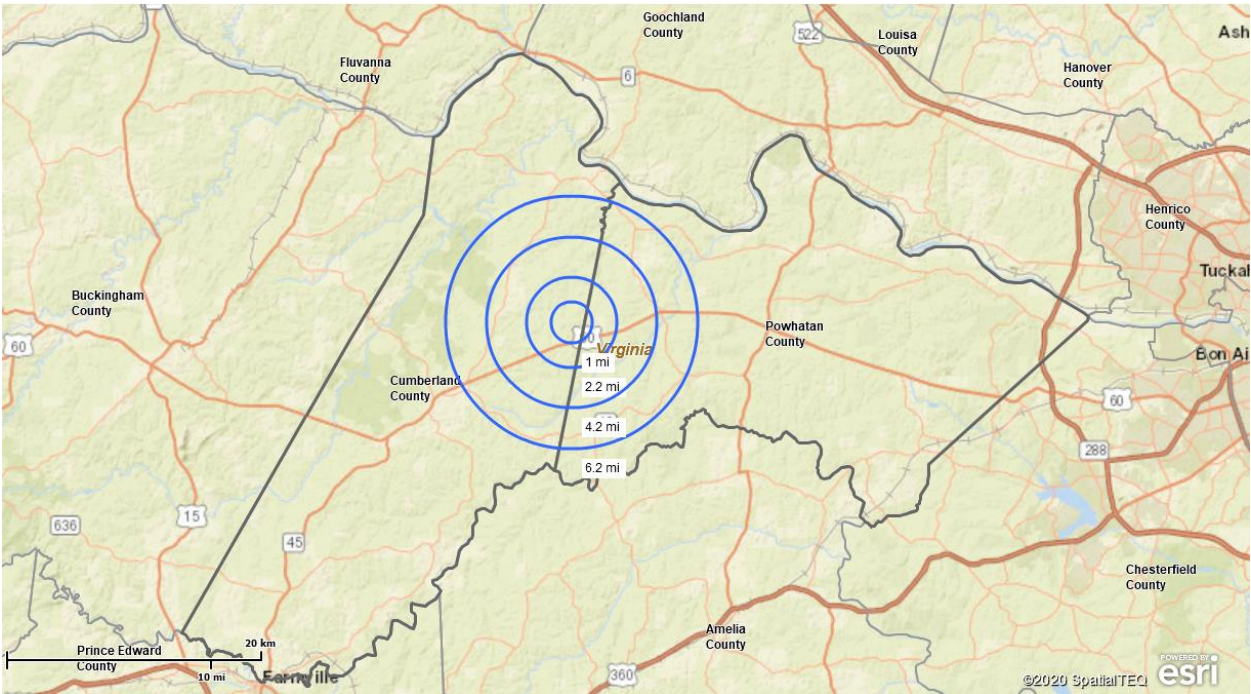


⁴ Map source: Mapbusinessonline.com.



Figure 3 shows how the areas that are most affected (indicated by the blue circles) fit in relation to the borders of Cumberland and Powhatan County (indicated by the dark grey boundary lines).

Figure 3. Areas Most Affected by the Proposed Green Ridge Facility in Relation to County Boundaries⁵



Current Demographics of the Areas Around Green Ridge

The people living within each of the 1-, 2.2-, 4.2-, and 6.2-mile radius circles around the proposed Green Ridge facility are those who might possibly be affected by the facility. Beyond that, we provide demographics on residents of Cumberland and Powhatan counties in Virginia for the purpose of comparison. Current data (2019) provided by GeoLytics includes basic demographic data – population, household, income, race, employment, and housing data. Table 1 reports the basic demographic data for the areas within 1, 2.2, 4.2, and 6.2 miles of the proposed Green Ridge Facility.

⁵ Map source: Mapbusinessonline.com.

Table 1. 2019 Demographics for the Area Immediately Surrounding Green Ridge⁶

	1-Mile Radius	2.2-Mile Radius	4.2-Mile Radius	6.2-Mile Radius
Population	124	641	2,366	5,004
Density (population/square mile)	39.77	42.38	43.00	41.78
Households	46	237	873	1,854
Average household size (number of people)	2.68	2.70	2.71	2.70
Median household income‡	\$52,699	\$54,614	\$54,520	\$52,948
Race: White	99 (80%)	517 (81%)	1,923 (81%)	4,018 (80%)
Race: Black	24 (19%)	116 (18%)	417 (18%)	927 (19%)
Race: American Indian or Alaska Native	0	1 (<1%)	3 (<1%)	6 (<1%)
Race: Asian	0	0	0	0
Race: Pacific Islander	0	0	0	0
Race: Other	1 (1%)	6 (1%)	24 (1%)	53 (1%)
Education: Graduated high school*	53 (59%)	284 (62%)	1,087 (63%)	2,341 (64%)
Education: Graduated college*	11 (12%)	54 (12%)	198 (12%)	408 (11%)
Employment status: Employed	55 (95%)	291 (96%)	1,083 (96%)	2,309 (96%)
Employment status: Unemployed	3 (5%)	12 (4%)	42 (4%)	86 (4%)
Total Housing units	62	310	1,137	2,454
Housing units: Owner occupied	40 (65%)	209 (67%)	775 (68%)	1,654 (67%)
Housing units: Renter occupied	6 (10%)	28 (9%)	98 (9%)	200 (8%)
Median monthly rent	\$814	\$866	\$863	\$896
Median housing value	\$146,566	\$158,535	\$163,511	\$174,120

* Percentages for education are as a percent of adults aged 20 and over.

‡ Overall median household income in the rural localities of Virginia was \$40,153 in 2019.

Remember that a 4.2-mile and 6.2-mile radius from the central area of the facility is needed in order to include all of the people who live 3 miles and 5 miles from the edge of the facility. These statistics show that the people who live 1 mile or less from Green Ridge are very similar to those who live 3 miles and 5 miles or less from the edge of the facility. That is seen in the fact that the population density, average household size, median household income, racial make-up, rate of employment is very similar within all of the radii. There are some differences across the areas (for example, in high school graduation rate and median housing value) that are normal for data. These variations indicate that the data is real and not simulated by an algorithm.

Table 2 shows how the populations differ within the 1-mile and 6.2-mile radii on either side of the Cumberland-Powhatan county line. The 1-mile radius is almost completely within Cumberland County, while the other radii include parts of Powhatan County. The Powhatan County population that is within the radii is significantly more white than for the state of Virginia as a whole.

⁶ Data source: GeoLytics.



Table 2. 2019 Demographics for the Cumberland and Powhatan Areas Closest to Green Ridge⁷

	1-Mile Radius Cumberland†	1-Mile Radius Powhatan†	6.2-Mile Radius Cumberland†	6.2-Mile Radius Powhatan†
Population	103	21	2,299	2,705
Density (population/square mile)	37.7	52.78	34.03	51.67
Households	38	8	873	981
Average household size (number of people)	2.68	2.71	2.63	2.76
Median household income‡	\$50,775	\$66,308	\$40,460	\$62,229
Race: White	83 (81%)	16 (76%)	1,737 (76%)	2,281 (84%)
Race: Black	19 (19%)	5 (24%)	545 (24%)	382 (14%)
Race: American Indian or Alaska Native	0	0	0	6 (<1%)
Race: Asian	0	0	0	0
Race: Pacific Islander	0	0	0	0
Race: Other	1 (1%)	0	17 (1%)	36 (1%)
Education: Graduated high school*	42 (59%)	11 (85%)	952 (58%)	1,389 (69%)
Education: Graduated college*	9 (13%)	2 (15%)	187 (11%)	221 (11%)
Employment status: Employed	45 (94%)	10 (100%)	1,028 (95%)	1,281 (97%)
Employment status: Unemployed	3 (6%)	0	52 (5%)	34 (3%)
Total Housing units	52	10	1,260	1,194
Housing units: Owner occupied	33 (63%)	7 (63%)	760 (60%)	894 (75%)
Housing units: Renter occupied	5 (10%)	1 (10%)	113 (9%)	87 (7%)
Median monthly rent	\$785	\$1,028	\$780	\$1,052
Median housing value	\$138,439	\$181,487	\$138,689	\$177,851

* Percentages for education are as a percent of adults aged 20 and over.

† Percentages may not sum to 100% because of rounding.

‡ Overall median household income in the rural localities of Virginia was \$40,153 in 2019.

We can compare the demographics of the area nearest to the proposed facility with those of wider areas around the facility – in Cumberland and Powhatan counties, and in the overall state of Virginia. Table 3 shows the demographics of those areas.

⁷ Data source: GeoLytics.



Table 3. Demographics for the Wider Areas Around Green Ridge⁸

	Cumberland County	Powhatan County	Virginia
Population	9,520	28,895	8,718,906
Density (population/square mile)	32.00	111.05	220.84
Households	3,764	9,861	3,305,367
Average household size (number of people)	2.52	2.71	2.56
Median household income	\$45,328	\$78,004	\$62,729
Race: White	6,564 (69%)	25,603 (89%)	5,929,845 (68%)
Race: Black	2,872 (30%)	2,938 (10%)	1,672,970 (19%)
Race: American Indian or Alaska Native	2 (<1%)	11 (<1%)	9,283 (<1%)
Race: Asian	0	32 (<1%)	487,398 (6%)
Race: Pacific Islander	0	0	1,336 (<1%)
Race: Other	82 (1%)	311 (1%)	618,074 (7%)
Education: Graduated high school*	4,139 (60%)	16,452 (74%)	4,757,114 (75%)
Education: Graduated college*	772 (11%)	4,019 (18%)	1,812,097 (29%)
Employment status: Employed	4,426 (95%)	14,077 (97%)	4,236,582 (97%)
Employment status: Unemployed	225 (5%)	367 (3%)	144,295 (3%)
Total Housing units	5,803	12,305	3,926,519
Housing units: Owner occupied	3,137 (54%)	9,299 (76%)	2,259,458 (58%)
Housing units: Renter occupied	627 (11%)	562 (5%)	1,045,909 (27%)
Median monthly rent	\$790	\$1,382	\$1,277
Median housing value	\$139,570	\$194,338	\$162,361

* Percentages for education are as a percent of adults aged 20 and over.

Comparing the demographics of the area within 6.2 miles of Green Ridge with the broader areas reveals some differences. The area within 6.2 miles of Green Ridge has fewer people per square mile than Powhatan County and Virginia, statewide. The percentage of black residents in the area within 6.2 miles of Green Ridge is approximately equal to that of the statewide population in Virginia. The areas within a few miles of Green Ridge have a higher median household income than Cumberland County, but lower than Powhatan County and Virginia, statewide.

⁸ Data source: GeoLytics.



Demographic Trends of the Areas Around Green Ridge

Trends in demographic data are useful to look for emerging changes in demographic patterns and for anomalies that may suggest that the data is unreliable. The graphs below show the trends in the data for the major statistics of interest. The specific measures were chosen so as to keep them comparable across the different geographies. For example, instead of showing population trends that are very dependent on the size of the area in square miles, we show trends in population density (residents per square mile) that is comparable regardless of the number of square miles of the area. Because the square mileage of an area stays the same over time, any increase in population density can only be caused by an increase in population. Figures 4 through 7 on the following pages show the trends in population density, median household income, the percentage of non-white, minorities, and adult unemployment.

Figure 4 shows the trends in population density (residents per square mile) from 2012 through 2019. As the chart makes clear, population density (and therefore population) in all of the areas around the proposed Green Ridge facility has been very stable and increasing slightly over the last seven years. The chart also clearly shows that Powhatan County has more than twice as many residents per square mile than the area immediately surrounding Green Ridge. The state of Virginia overall is more than 5 times as densely populated as the areas within 6.2 miles of Green Ridge.

Figure 5 shows the trends in median household income. Notably, median household income within 6.2 miles of Green Ridge has declined while in the other areas it has remained stable or increased. Though the median income in Cumberland County has risen since 2016, it is significantly below the median income in Powhatan County and in Virginia, overall.

Figure 6 shows the trends in the percent of the population that is non-white, minority. Across all of the areas the non-white, minority population has declined since 2012. Over the last several years, the racial mix in Cumberland County has changed from having a greater proportion of non-white, minorities than Virginia overall, to being very close to the overall state proportion. The percentage of non-white, minority people living within 6.2 miles of Green Ridge has remained relatively stable over the last several years at a level that is significantly less than the statewide average.

Figure 7 shows the trends in unemployment. In all areas, unemployment has declined significantly since about 2013, 2014, or 2015. Unemployment in Cumberland County is still much higher than the statewide average and unemployment in neighboring Powhatan County.



Figure 4. Population Density in Areas Relevant to the Proposed Green Ridge Facility⁹

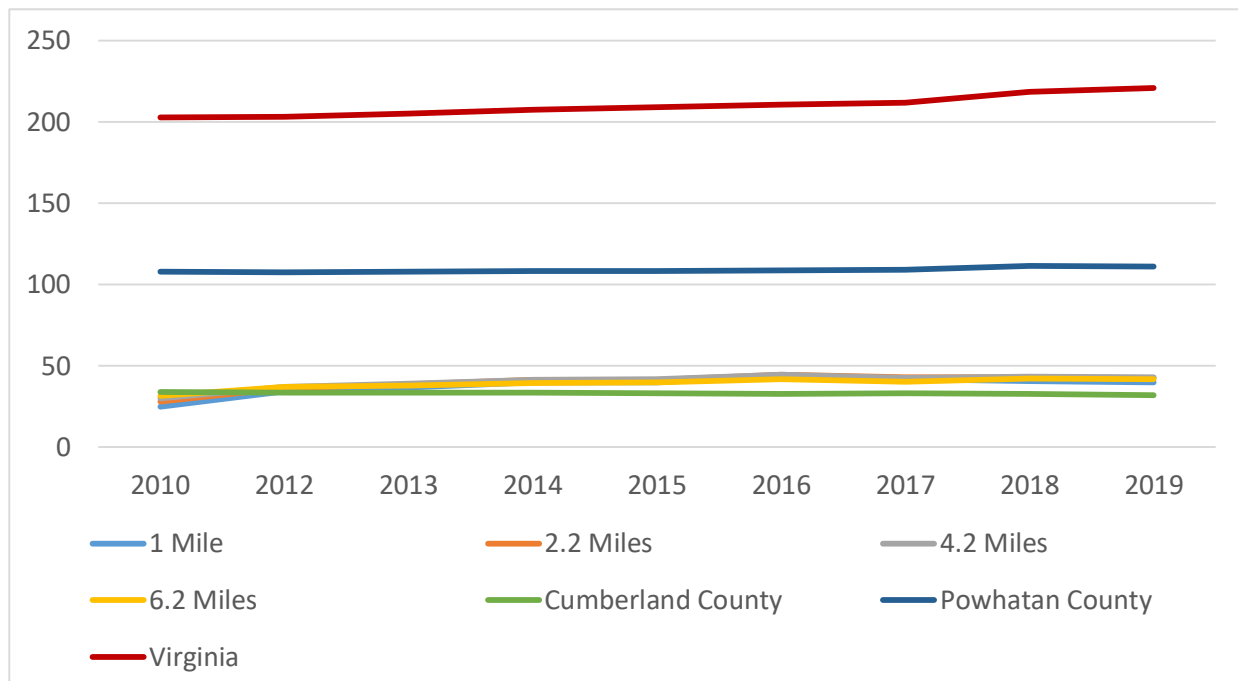
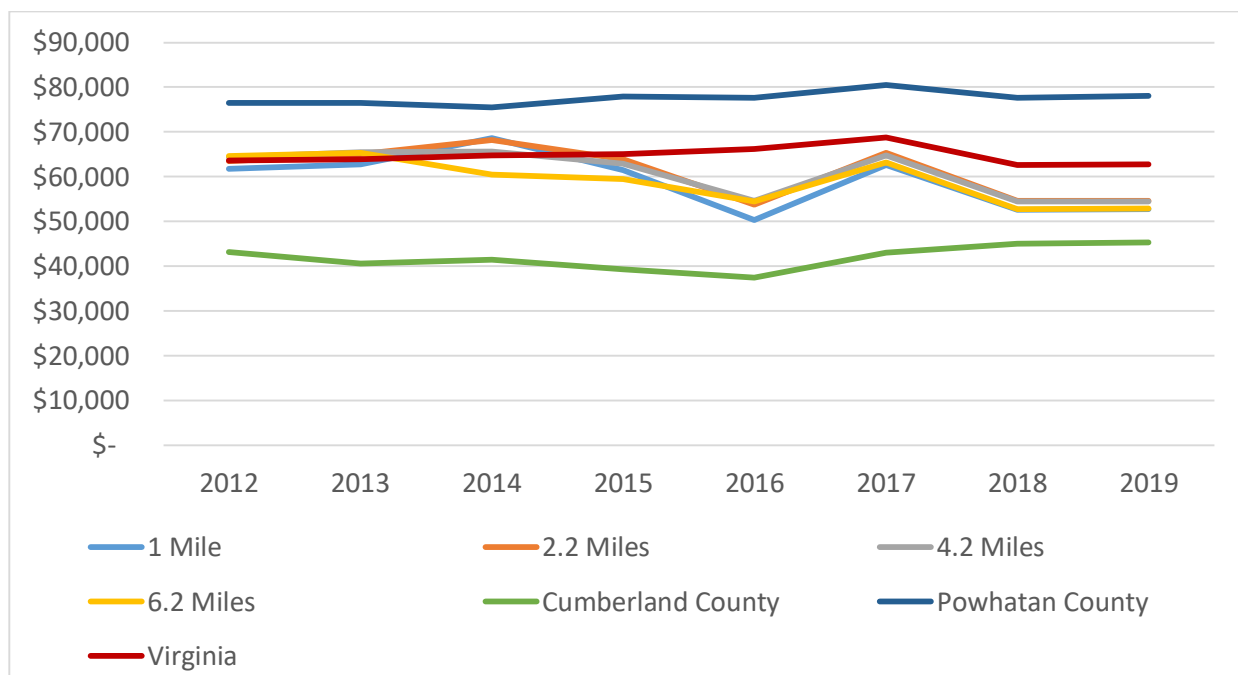


Figure 5. Median Household Income in Areas Relevant to the Proposed Green Ridge Facility¹⁰



⁹ Data source: US Census Bureau and GeoLytics.

¹⁰ Data source: US Census Bureau and GeoLytics.



Figure 6. Non-white Minority Populations in Areas Relevant to the Proposed Green Ridge Facility¹¹

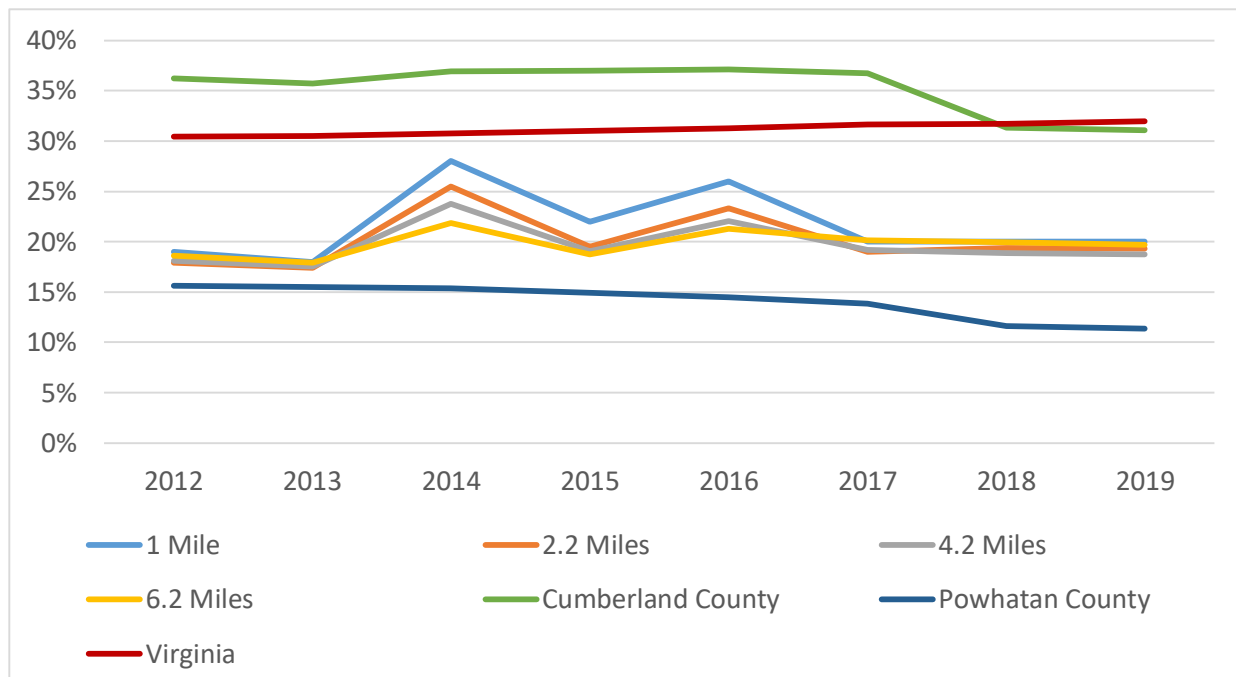
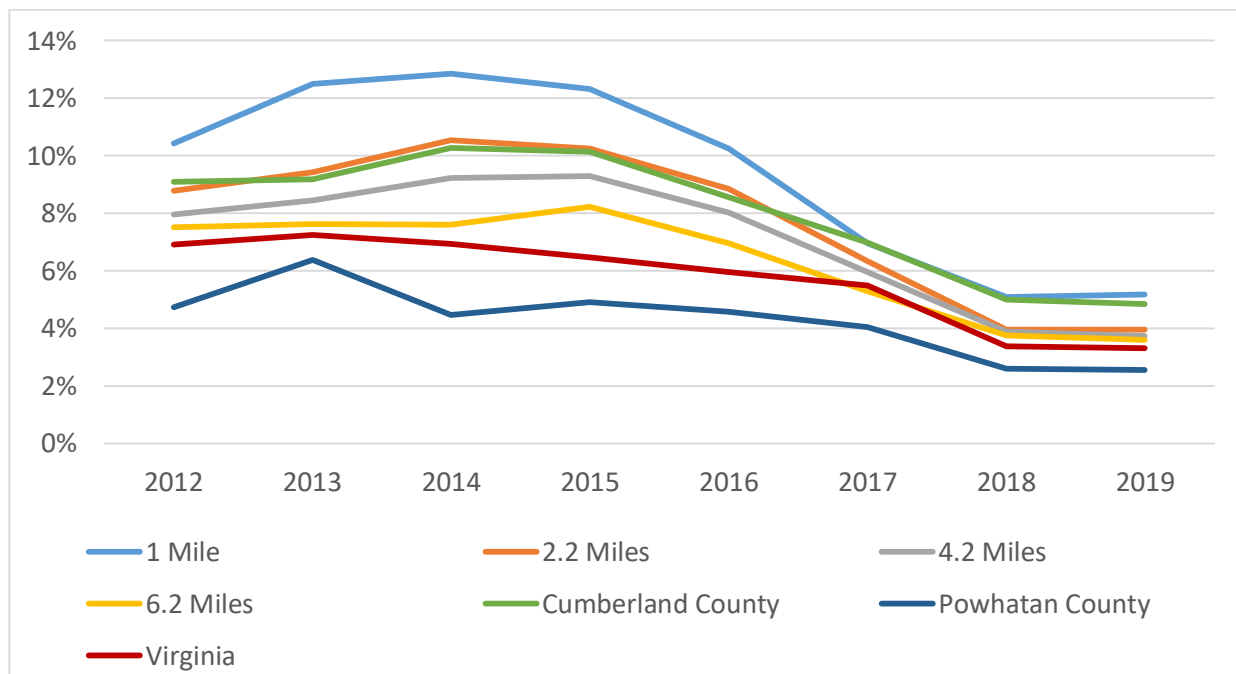


Figure 7. Unemployment in Areas Relevant to the Proposed Green Ridge Facility¹²



¹¹ Data source: US Census Bureau and GeoLytics.

¹² Data source: US Census Bureau and GeoLytics.



Conclusion

This report provides demographic data on the areas immediately surrounding the proposed Green Ridge Recycling and Disposal Facility in Cumberland County. We compared data on areas within a 1-mile, 2.2-mile, 4.2-mile, and 6.2-mile radius of the facility to demographic data for Cumberland and Powhatan Counties, and Virginia statewide data. Our approach is consistent with guidance from the US Environmental Protection Agency on collecting data for environmental justice issues. We used high quality data from the US Census Bureau and data from a widely used demographics firm.

Among the people living within 6.2 miles of the proposed Green Ridge facility, the main difference is that Powhatan County residents are significantly more likely to be white, have more education, and have higher median household income.

There are also significant differences between the people living a few miles of the proposed facility and the populations of Cumberland or Powhatan county or the statewide population of Virginia. Fewer people per square mile live in the area within 6.2 miles of Green Ridge than in Virginia overall and in Powhatan County; however, the area within 6.2 miles of Green Ridge is more densely populated (more residents per square mile) than in Cumberland County overall. Overall, the state of Virginia is more than 5 times more densely populated than the area immediately surrounding Green Ridge.

The population within 6.2 miles of Green Ridge has a significantly higher percentage of white residents than all of the comparative areas, except for Powhatan County which has a significantly higher percentage of white residents than all of the areas discussed in this report. The percentage of black residents within 6.2 miles of Green Ridge is approximately equal to that of the statewide population in Virginia. Moreover, the percentage of black residents within each of the radii immediately surrounding Green Ridge (18% - 19%) is significantly lower than in Cumberland County as a whole (30%). Additionally, the percentage of black residents within the 6.2-mile radius in Powhatan County (14%) is significantly lower than in the state as a whole (19%). The area immediately surrounding Green Ridge has a higher median household income than Cumberland County, but lower than Powhatan County and Virginia, statewide. In comparison to rural localities in Virginia, the residents living within the 6.2 miles of Green Ridge have a much higher median household income than Virginia rural residents.

We also reported on demographic trends in the areas from 2012 through 2019. Population density in of the areas around the proposed Green Ridge facility has been increasing slightly over the last seven years. Median household income within 6.2 miles of Green Ridge has declined while in the other areas it has remained stable or increased. Though median incomes in Cumberland County have risen since 2016, they are significantly below median incomes in Powhatan County and in Virginia, overall. Across all of the areas, the non-white, minority population has declined since 2012. Over the last several years, the racial mix in Cumberland County has changed from having a greater proportion of non-white, minorities than Virginia overall, to being very close to the overall state proportion. The percentage of non-white, minority people living within 6.2 miles of Green Ridge has remained relatively stable over the last



several years at a level that is significantly less than the statewide average. While, in all areas unemployment has declined significantly since about 2013, 2014, or 2015, unemployment in Cumberland County is still notably higher than the statewide average or unemployment in neighboring Powhatan County.

Based on high-quality census data, the area within 6.2 miles of the proposed Green Ridge Recycling and Disposal Facility in Cumberland County has a minority concentration that mirrors that of the overall state of Virginia and that is lower than Cumberland County. People living within 6.2 miles of Green Ridge have a higher median household income than people living in Cumberland County overall and higher than people living in the rural localities in Virginia overall.

The area within 6.2 miles of the proposed Green Ridge facility would appear to be suitable for a facility that is best suited to an area with a low population density. Given that Cumberland County currently and for at least the last several years has a higher unemployment rate than neighboring Powhatan County and the state of Virginia as a whole, the facility would also be suitable to provide jobs for local residents and reliable tax revenue for Cumberland County.

AUGUST 6, 2020



GREEN RIDGE

RECYCLING AND DISPOSAL FACILITY

ADDENDUM TO STANDARD DEMOGRAPHICS FOR THE AREAS AROUND THE GREEN RIDGE PROJECT IN CUMBERLAND COUNTY, VIRGINIA

PREPARED BY



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About Mangum Economics, LLC

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The Mangum Economics Team

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Economist

A. Fletcher Mangum, Ph.D.

Founder and CEO

Martina Arel, M.B.A.

Researcher and Economic Development Specialist



Addendum

Magnum Economics was asked to include additional information in its demographic report dated June 16, 2020 relating to the Green Ridge Recycling and Disposal Facility. As the June report reflects, the median income for those households within the geographic areas analyzed is substantially above the State's median household income for rural localities. We were asked to also add data reflecting the percentages of households that are at or below the poverty level within the report's identified radii. This addendum provides that information.¹

The 2020 Poverty Guidelines for the 48 Contiguous States and the District of Columbia indicate that for a family/household of three people, the poverty level is \$21,720.² The average household size in the areas analyzed in our demographic report ranges between two to three people. The closest Census category for household income that would include all of the households below the 2020 poverty level is \$20,000 to \$24,999. Therefore, we have provided in this addendum the number and percentage of households with total household income below \$25,000 as a measure of the number of households below or near the poverty line. Doing this will somewhat overstate the percentage of households at or below the poverty line. So, this approach provides a worst case scenario in terms of the percentage of households at or below the poverty line. It also represents the most conservative approach, because it helps ensure that the percentages of households at or below poverty line are not underestimated, while also including households that are close to the poverty line, albeit slightly above it.

As reflected in the tables below, in 2019, approximately 33 percent of all households in Virginia's rural localities have household income below \$25,000. The percentage of households in Cumberland County as a whole mirrors that 33 percent, almost exactly. More significantly, and as Table 1 shows, the percentages of households with incomes below \$25,000 within 1 mile, 2.2 miles, 4.2 miles, and 6.2 miles of the Green Ridge facility are significantly below the State percentage, as well as the percentage in Cumberland County as a whole. This is true even when excluding households in the more affluent Powhatan County and only including Cumberland County households. Thus, the Green Ridge facility will be located in the part of Cumberland County that is less poor than Cumberland County as a whole. It will also be located near the much more affluent Powhatan County, where poverty rates are substantially below the statewide average.

Table 1 reports the number and percentage of households with household income below \$25,000 for the areas within 1, 2.2, 4.2, and 6.2 miles of the proposed Green Ridge Facility.

¹ In this addendum, we have also updated the median income for rural localities in Virginia, to be consistent with the [Weldon Cooper Center's 2019 revision](#) of the Virginia localities in metropolitan statistical areas. Rural localities are all those not included in metropolitan statistical areas. Localities in micropolitan statistical areas are considered rural, including the counties of Dickenson, Henry, Pittsylvania, Tazewell, and Wise, and the cities of Danville, Martinsville, and Norton. After including those localities to our analysis, the median rural household income in Virginia decreases from our original figure of \$40,153 to \$39,458.

² Department of Health and Human Services, "Annual Update of the HHS Poverty Guidelines," 85 *Federal Register* 3060, January 17, 2020.



Table 1. 2019 Households with Income under \$25,000 for the Areas Immediately Surrounding Green Ridge³

	1-Mile Radius	2.2-Mile Radius	4.2-Mile Radius	6.2-Mile Radius
Households with household income under \$25,000	10 (22%)	53 (22%)	204 (23%)	475 (26%)

Table 2 shows the number and percentage of households with household income below \$25,000 within the 1-mile and 6.2-mile radii on either side of the Cumberland-Powhatan county line. The 1-mile radius is mostly within Cumberland County, while the other radii include parts of Powhatan County.

Table 2. 2019 Households with Income under \$25,000 for the Cumberland and Powhatan Areas Closest to Green Ridge⁴

	1-Mile Radius Cumberland	1-Mile Radius Powhatan	6.2-Mile Radius Cumberland	6.2-Mile Radius Powhatan
Households with household income under \$25,000	9 (24%)	1 (13%)	261 (30%)	216 (22%)

Table 3 shows the number and percentage of households with household income below \$25,000 in Cumberland and Powhatan counties, and in the overall state of Virginia.

Table 3. 2019 Households with Income under \$25,000 for the Wider Areas Around Green Ridge⁵

	Cumberland County	Powhatan County	Rural Localities in Virginia	Virginia, Statewide
Households with household income under \$25,000	1,245 (33%)	1,397 (14%)	137,110 (33%)	601,571 (18%)

³ Data source: GeoLytics.

⁴ Data source: GeoLytics.

⁵ Data source: GeoLytics.

ATTACHMENT 7

KBJW - *SUMMARY OF WETLAND AND WATER IMPACTS TABLE*

DATED APRIL 28, 2021

KBJW - *IMPACT PLATES - SHEETS C1.0 THROUGH C1.11*

DATED APRIL 15, 2021

Table 1.0: Summary of Wetland and Water Impacts for the Proposed Green Ridge Facility Joint Permit Application

Impact #	Impact Type	Impact Description	Lat./Long.	Cowardin Class	Stream Length (ft.)	Waters impact area (square feet)	Waters impact area (acreage)
1.1	P	F, EX, NT, PE, PR, NV	37.55843 / -78.12935	R3	700	3,500	0.080
1.2	P	F, EX, NT, PE, PR, NV		R3	184	920	0.021
1.3	P	F, EX, NT, PE, NV		R6	952	2,856	0.066
2.1	P	F, EX, NT, PE, PR, NV	37.56169 / -78.12782	R3	2,387	11,935	0.274
2.2	P	F, EX, NT, PE, NV		R6	542	1,626	0.037
3.1	P	F, EX, NT, PE, PR, NV	37.56532 / -78.12910	R3	433	2,165	0.050
3.2	P	F, EX, NT, PE, NV		R6	1,382	4,146	0.095
4.1	P	F, EX, NT, PE, PR, NV	37.56720 / -78.12854	R3	820	4,100	0.094
5.1	P	F, EX, NT, PE, PR, NV	37.56931 / -78.12850	R3	300	1,500	0.034
5.2	P	F, EX, NT, PE, NV		R6	714	2,142	0.049
6.1	P	F, EX, NT, PE, NV	37.57020 / -78.12663	R6	239	717	0.016
7.1	P	F, EX, NT, PE, NV	37.56872 / -78.12397	R6	408	1,224	0.028
8.1	P	F, EX, NT, PE, NV	37.56649 / -78.12400	R6	131	393	0.009
9.1	P	F, EX, NT, PE, NV	37.56355 / -78.12348	R6	513	1,539	0.035
RR.1	S	F, EX, NT, PE, PR, NV	37.56533 / -78.13026	R3	170	850	0.020
RR.2	S	F, EX, NT, PE, PR, NV	37.55954 / -78.13088	R3	205	1,025	0.024
RR.3	P	F, EX, NT, PE, NV	37.55563 / -78.13361	R6	122	366	0.008
RR.4	P	F, EX, NT, PE, NV	37.55986 / -78.13135	R3	165	825	0.019
EW.1	P	F, EX, NT, PE, NV	37.54576 / -78.11207	R6	117	351	0.008
EW.2	P	F, EX, NT, PE, PR, NV	37.54917 / -78.11157	R3	181	905	0.021
EW.3	P	F, EX, NT, PE, PR, NV	37.55466 / -78.11066	R3	109	545	0.013
EW.4	P	F, EX, NT, PE, NV	37.55850 / -78.11501	R6	256	768	0.018
EW.5	P	F, EX, NT, PE, NV	37.57009 / -78.11260	R6	132	396	0.009
Total:					11,162	44,794	1.03

Green Ridge Recycling and Disposal LLC

PREPARED BY: KOONTZ BRYANT JOHNSON WILLIAMS

DATE: May 6, 2021

Table 1.1: Primary v. Secondary Impacts		
Impact Type	Impact Area (Acres)	Percentage of Total Impact
Primary (21)	0.99	91%
Secondary (2)	0.04	9%
Total Impacts (23)	1.03	100%
Table 1.2: Composition of Impact Causes		
Impact Cause	Impact Area (Acres)	Percentage of Total Impact
Landfill Impacts (14)	0.89	61%
Roadway Realignment (4)	0.07	17%
Entryway Construction (4)	0.06	17%
Borrow Road (1)	0.01	4%
Total Impacts (23)	1.03	100%

Green Ridge Recycling and Disposal LLC

PREPARED BY: KOONTZ BRYANT JOHNSON WILLIAMS

DATE: May 6, 2021

Table 1.3: Summary of Impacts by Cowardin Classification	
Cowardin Type	Linear Feet of Stream
Riverine - Upper Perennial (R3)/ Intermittent (R4)	5,654
Riverine - Ephemeral (R6)	5,376
Total	11,030

Green Ridge Recycling and Disposal LLC

PREPARED BY: KOONTZ BRYANT JOHNSON WILLIAMS

DATE: May 6, 2021

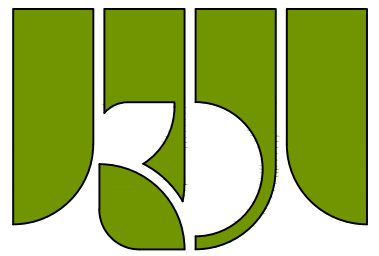
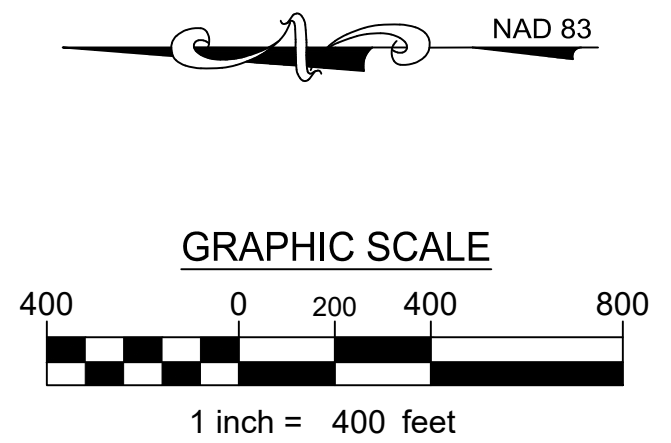
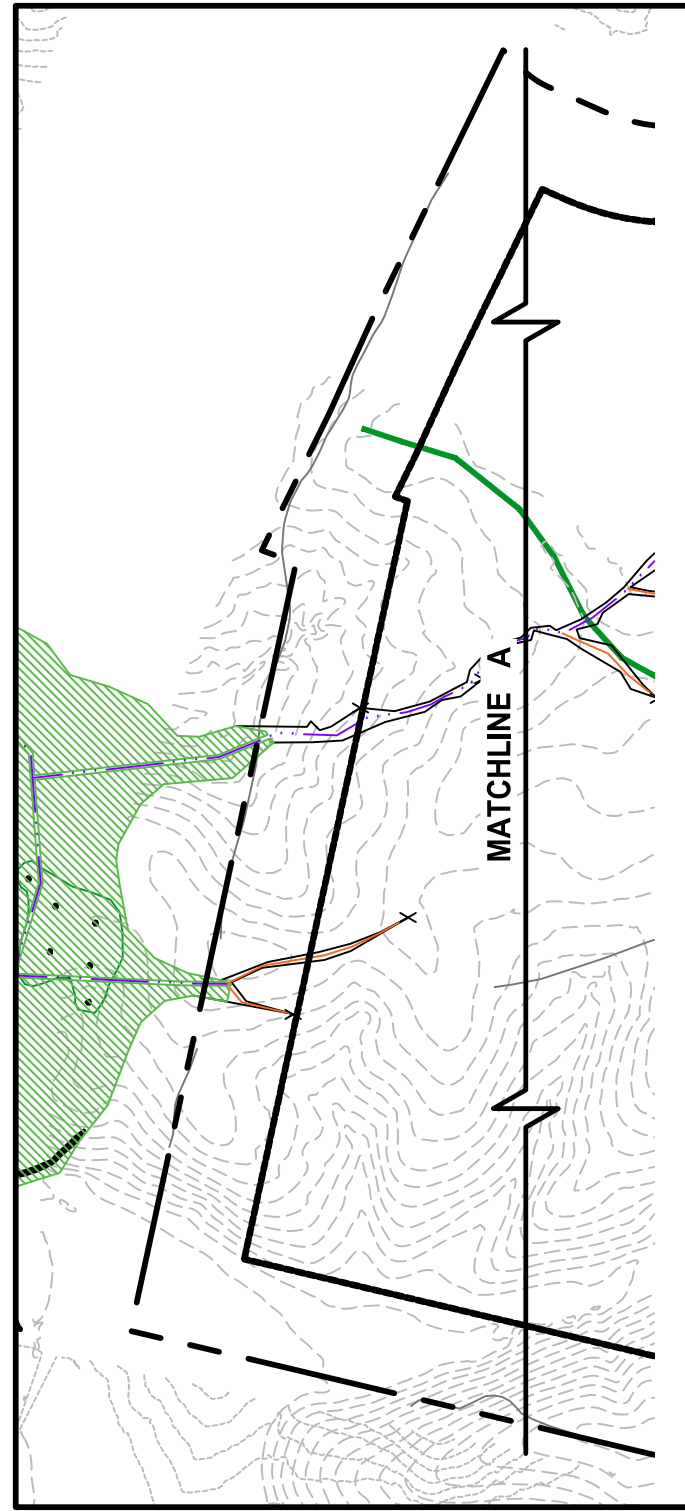
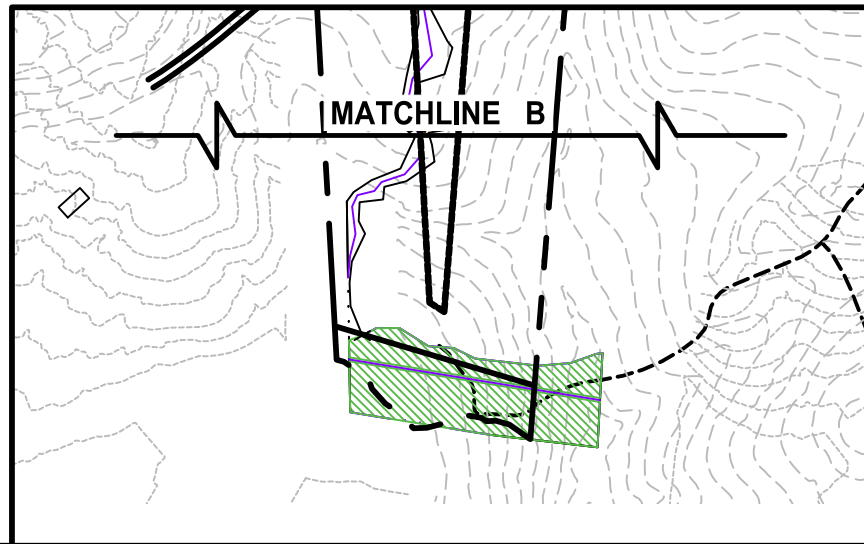
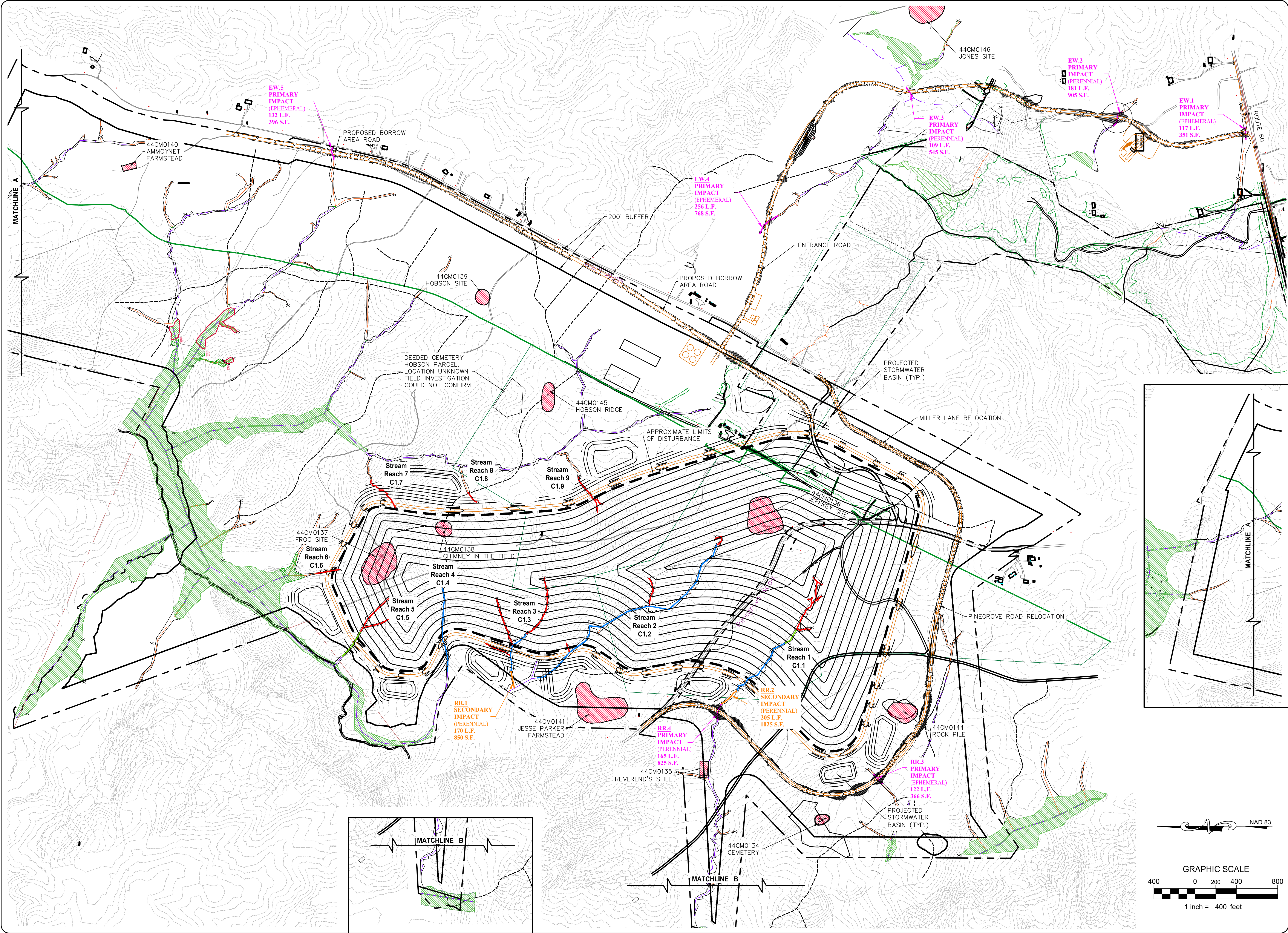
Table 1.4: Summary of Wetland and Water Impacts for the Proposed Green Ridge Facility				
Impact #	Cowardin Class	Stream Length (ft.)	Stream Width (ft.)	Waters impact area (square feet)
1.1	R3	700	5	3,500
1.2	R3	184	5	920
1.3	R6	952	3	2,856
2.1	R3	2,387	5	11,935
2.2	R6	542	3	1,626
3.1	R3	433	5	2,165
3.2	R6	1,382	3	4,146
4.1	R3	820	5	4,100
5.1	R3	300	5	1,500
5.2	R6	714	3	2,142
6.1	R6	239	3	717
7.1	R6	408	3	1,224
8.1	R6	131	3	393
9.1	R6	513	3	1,539
RR.1	R3	170	5	850
RR.2	R3	205	5	1,025
RR.3	R6	122	3	366
RR.4	R3	165	5	825
EW.1	R6	117	3	351
EW.2	R3	181	5	905
EW.3	R3	109	5	545
EW.4	R6	256	3	768
EW.5	R6	132	3	396

GREEN RIDGE RECYCLING AND DISPOSAL LLC

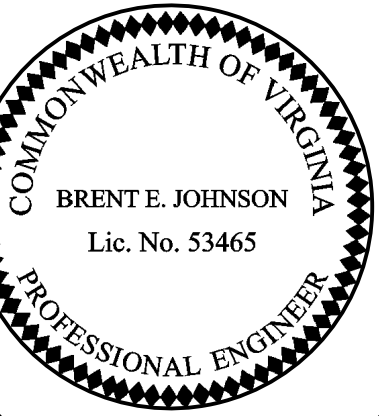
IMPACT - KEY

May 6, 2021

KEY			
Impact Type		Impact Description	
F	Fill	P	Primary
EX	Excavation	S	Secondary
S	Structure		
T	Tidal		
NT	Non-tidal		
TE	Temporary		
PE	Permanent		
PR	Perennial		
IN	Intermittent		
SB	Subaqueous bottom		
DB	Dune/beach		
IS	Hydrolog. Isolated		
V	Vegetated		
NV	Non-vegetated		
MC	Mechanized clearing of PFO		



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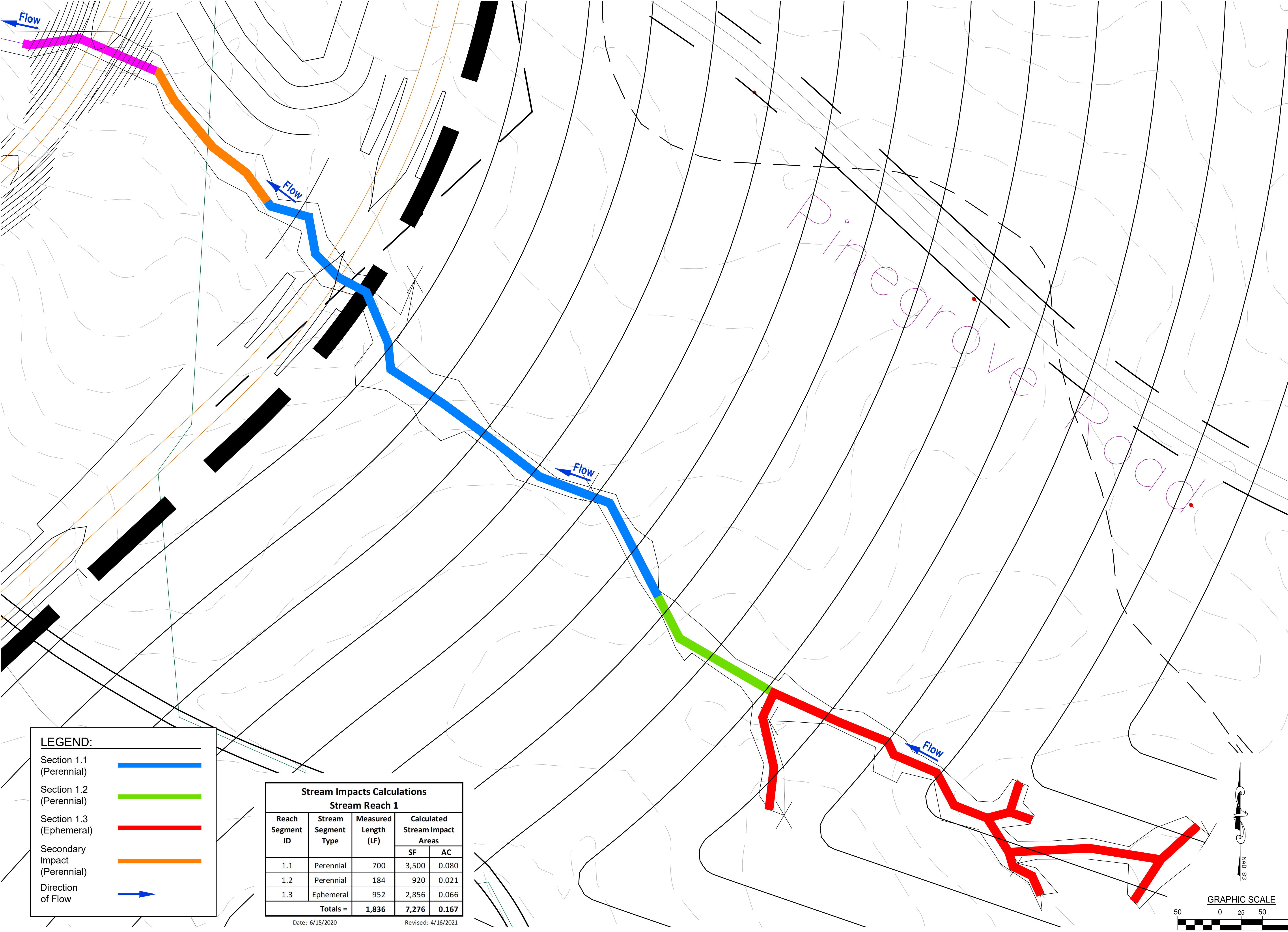
GREEN RIDGE RECYCLING AND DISPOSAL CENTER

CUMBERLAND COUNTY, VIRGINIA

OVERALL PLAN

SCALE: 1" = 400'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.0



LEGEND:

Section 1.1
(Perennial) —

Section 1.2
(Perennial) —

Section 1.3
(Ephemeral) —

Secondary
Impact
(Perennial) —

Direction
of Flow →

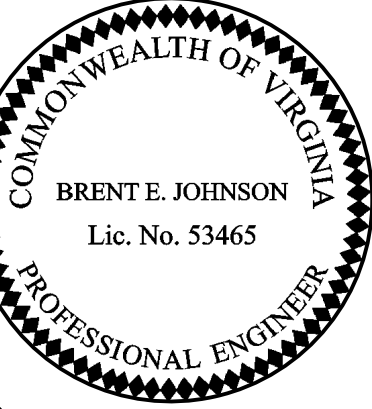
Stream Impacts Calculations					
Stream Reach 1					
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas		
			SF	AC	
1.1	Perennial	700	3,500	0.080	
1.2	Perennial	184	920	0.021	
1.3	Ephemeral	952	2,856	0.066	
Totals =		1,836	7,276	0.167	

Date: 6/15/2020

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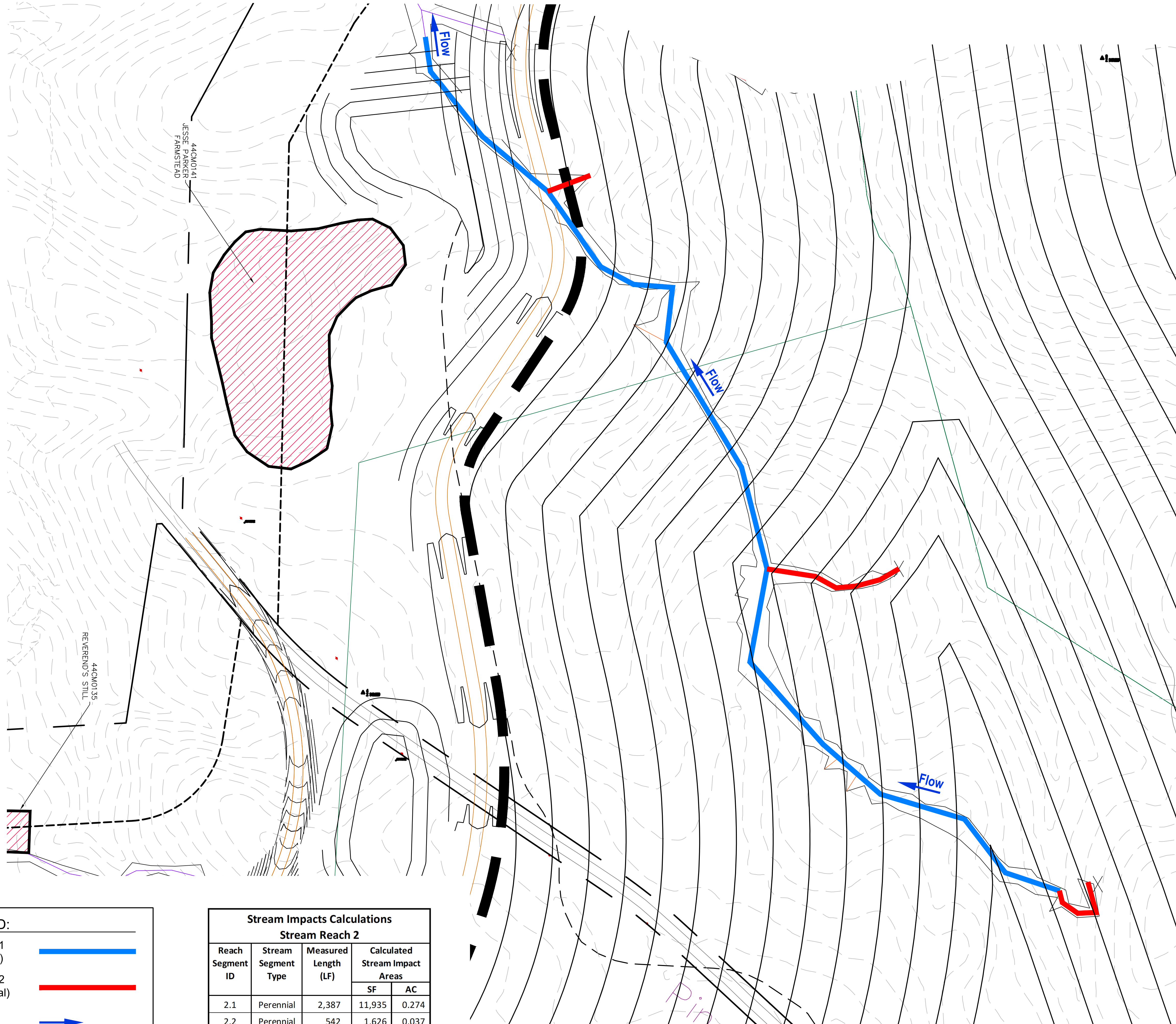
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**GREEN RIDGE RECYCLING AND
DISPOSAL CENTER**
CUMBERLAND COUNTY, VIRGINIA




STREAM REACH 1 IMPACTS

SCALE: 1"=50'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.1



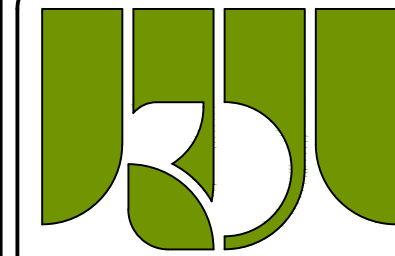
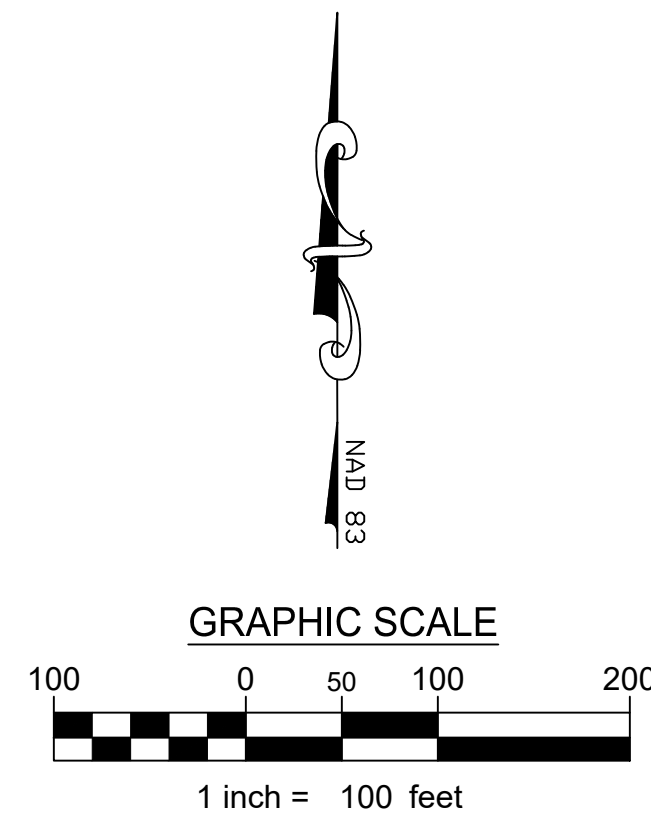
LEGEND:

- Section 2.1
(Perennial) 
- Section 2.2
(Ephemeral) 
- Direction
of Flow 

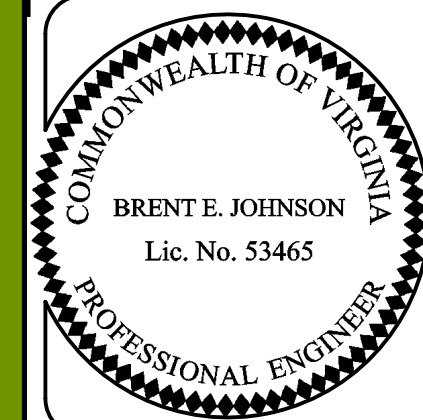
Stream Impacts Calculations					
Stream Reach 2					
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas		
			SF	AC	
2.1	Perennial	2,387	11,935	0.274	
2.2	Perennial	542	1,626	0.037	
Totals =		2,929	13,561	0.311	

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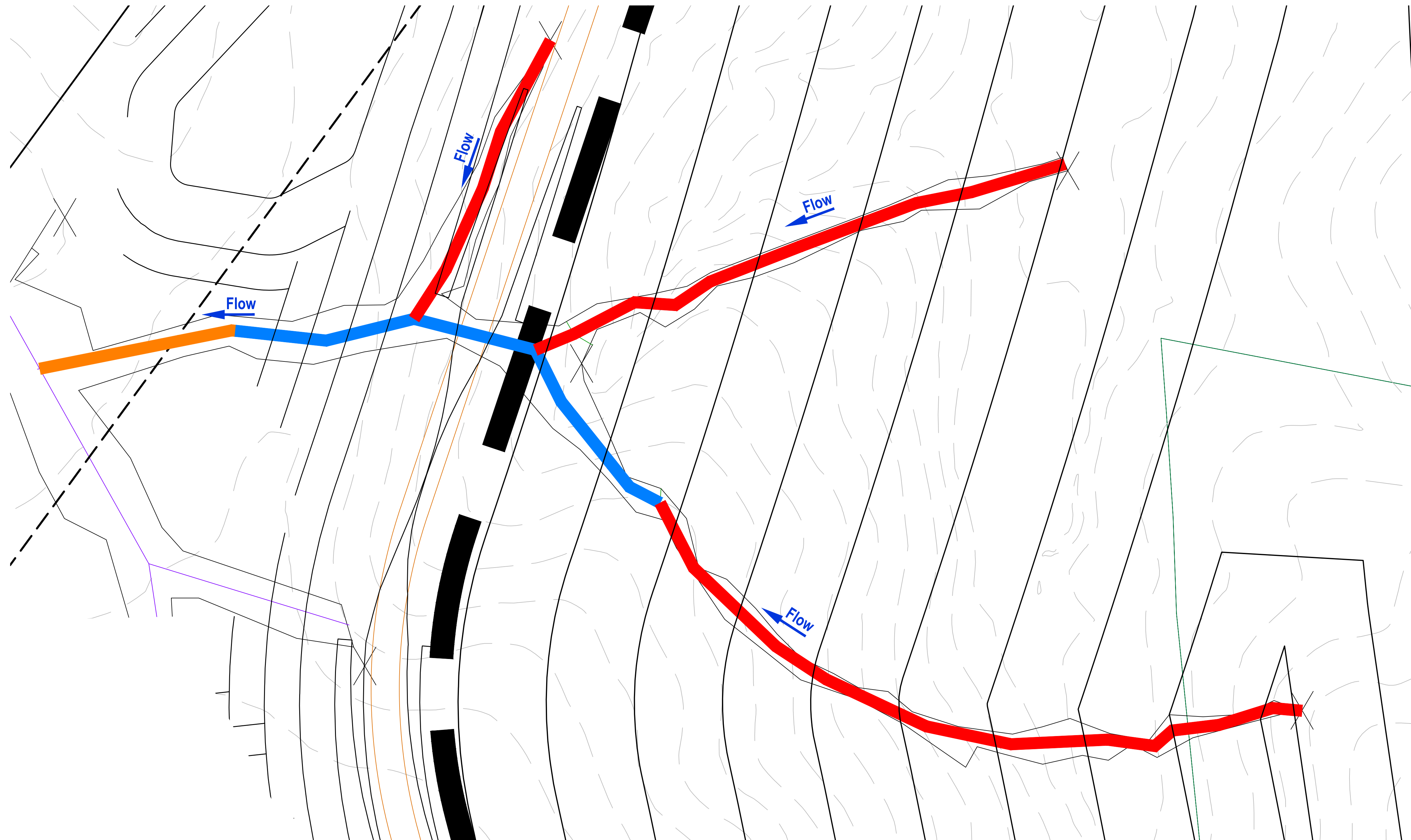
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BEJ	RWM	

**GREEN RIDGE RECYCLING AND
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CUMBERLAND COUNTY, VIRGINIA
STREAM REACH 2 IMPACTS

SCALE: 1"=100'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.2



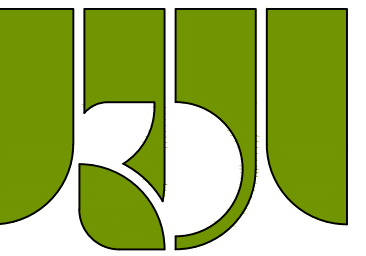
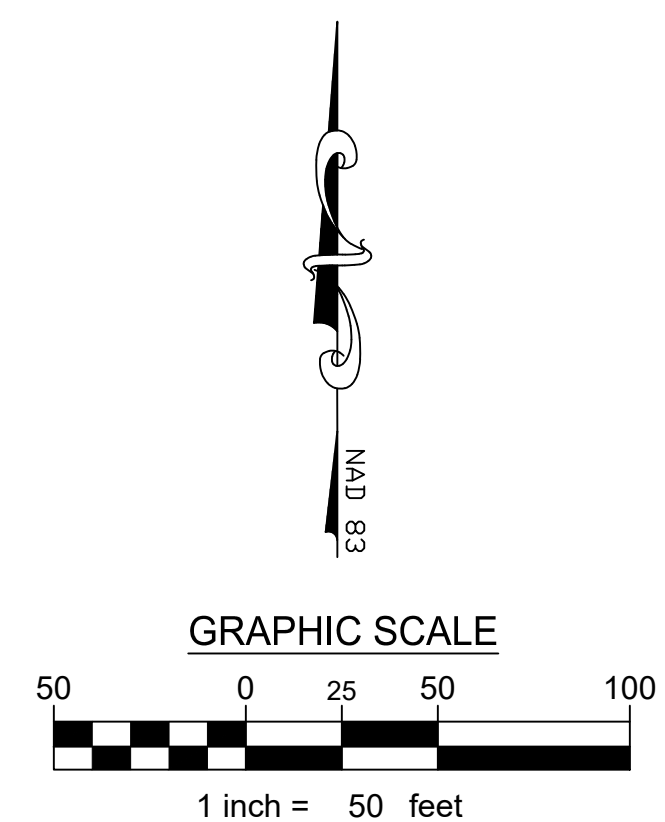
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- Section 3.1 (Perennial)
- Section 3.2 (Perennial)
- Section 3.2 (Ephemeral)
- Secondary Impact (Perennial)
- Direction of Flow

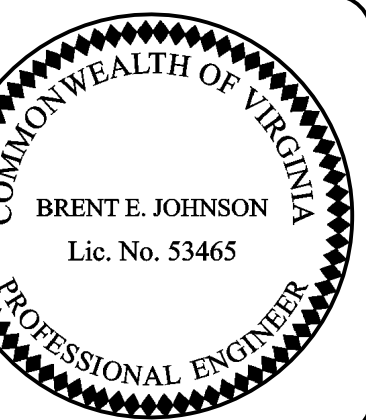
Stream Impacts Calculations Stream Reach 3				
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas	
			SF	AC
3.1	Perennial	433	2,165	0.050
3.2	Ephemeral	1,382	4,146	0.095
Totals =		1,815	6,311	0.145

Date: 6/15/2020

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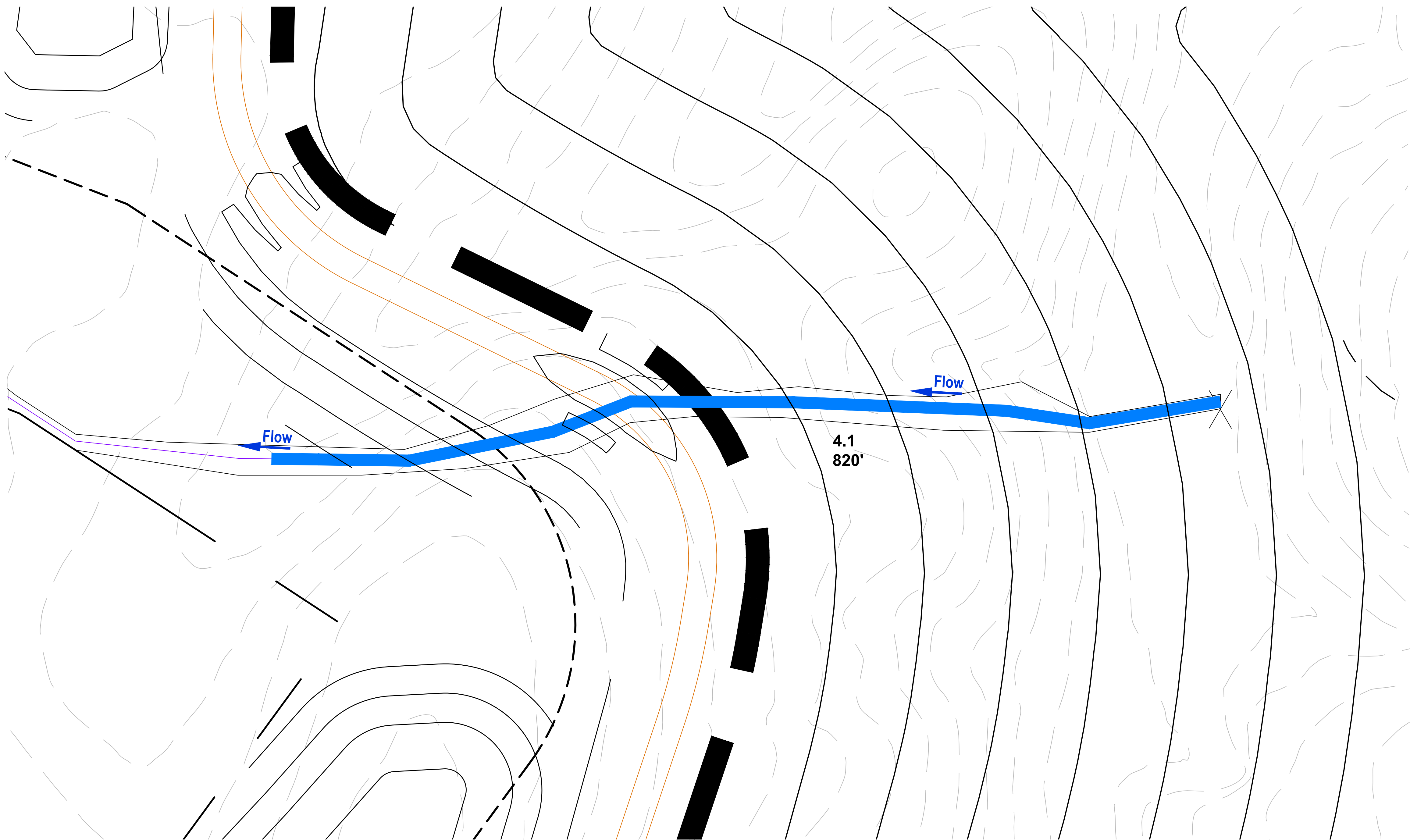
**GREEN RIDGE RECYCLING AND
DISPOSAL CENTER**

CUMBERLAND COUNTY, VIRGINIA


STREAM REACH 3 IMPACTS


SCALE: 1"=50'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.3



LEGEND:

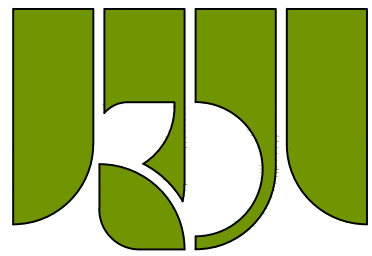
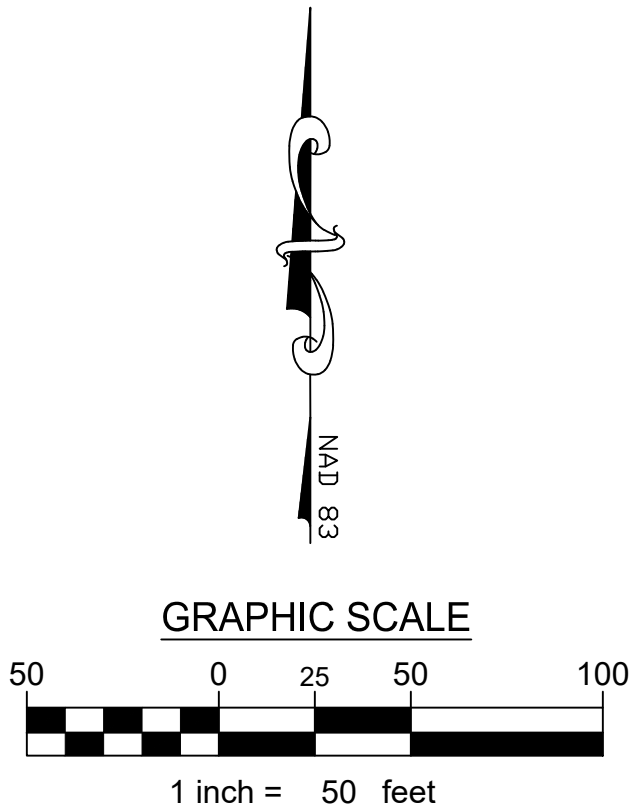
Section 4.1
(Perennial) 

Direction
of Flow 

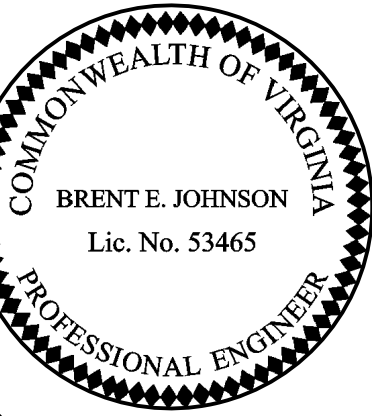
Stream Impacts Calculations Stream Reach 4				
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas	
			SF	AC
4.1	Perennial	820	4,100	0.094
Totals =		820	4,100	0.094

Date: 6/15/2020

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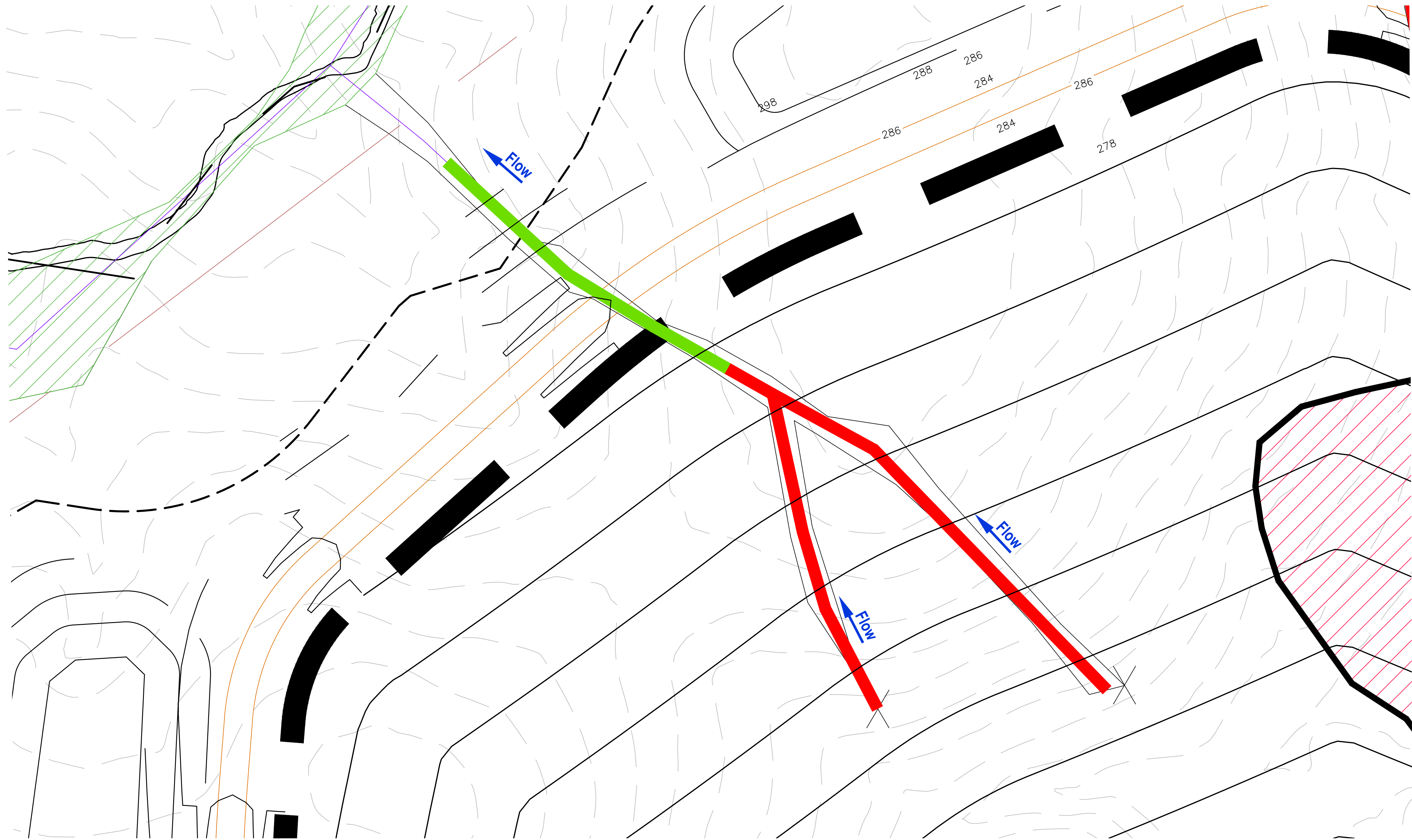
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BEJ	RWM	

**GREEN RIDGE RECYCLING AND
DISPOSAL CENTER**
CUMBERLAND COUNTY, VIRGINIA

STREAM REACH 4 IMPACTS

SCALE: 1"=50'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.4



LEGEND:

Section 5.1
(Perennial) —

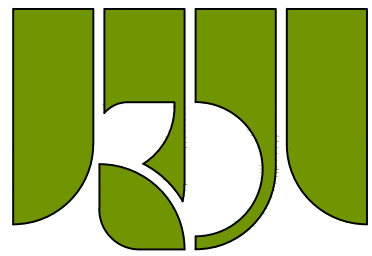
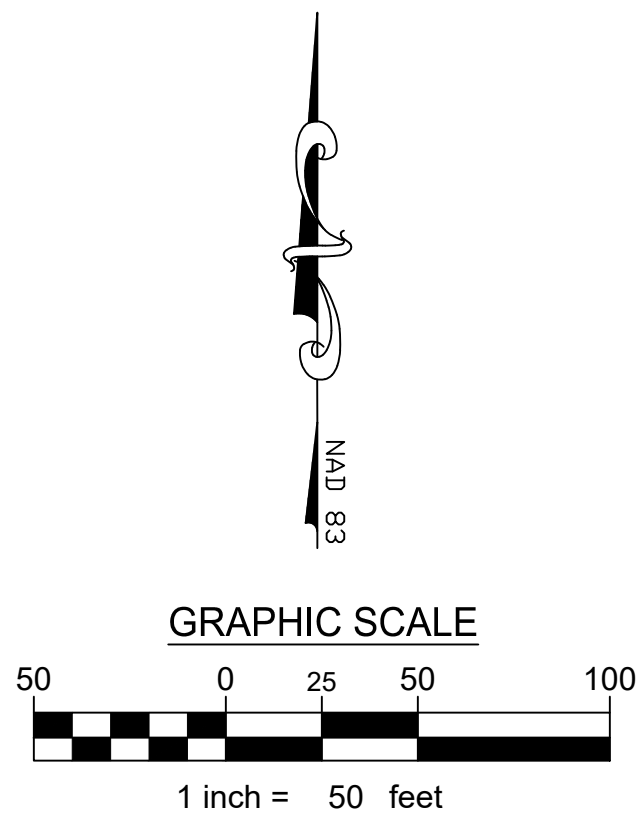
Section 5.2
(Ephemeral) —

Direction
of Flow ➔

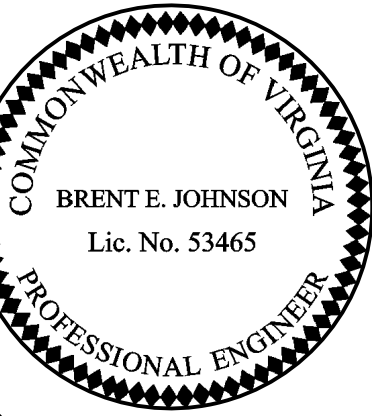
Stream Impacts Calculations Stream Reach 5					
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas		
			SF	AC	
5.1	Perennial	300	1,500	0.034	
5.2	Ephemeral	714	2,142	0.049	
Totals =		1,014	3,642	0.084	

Date: 6/15/2020

Revised: 4/16/2021



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2.	04/16/2021	RWM	REVISED PER CLIENT/COUNTY COMMENTS

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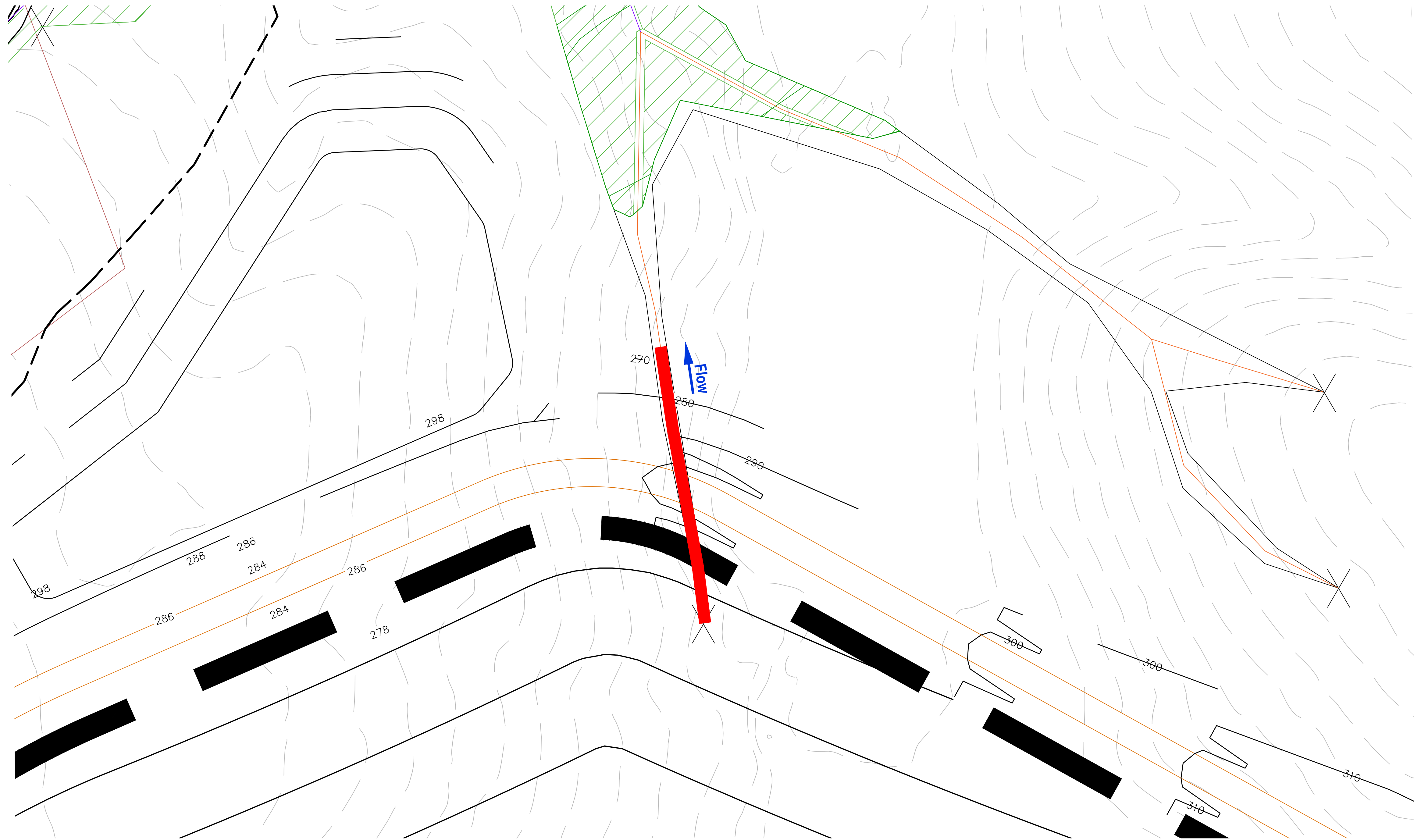
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**GREEN RIDGE RECYCLING AND
DISPOSAL CENTER**
CUMBERLAND COUNTY, VIRGINIA


STREAM REACH 5 IMPACTS

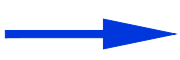
SCALE: 1"=50'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.5



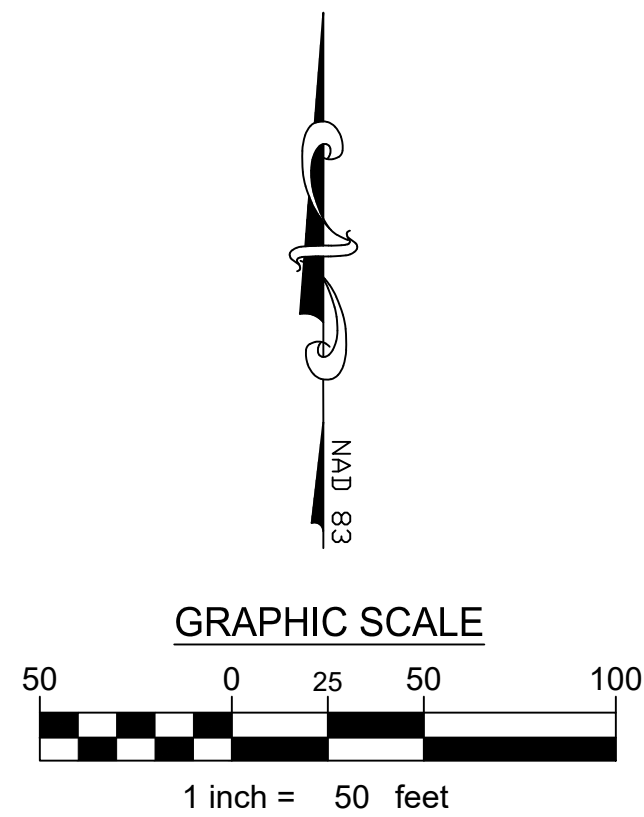
LEGEND:

Section 6.1
(Ephemeral) 

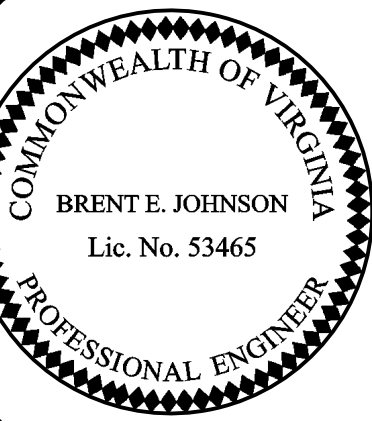
Direction
of Flow 

Stream Impacts Calculations Stream Reach 6				
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas	
			SF	AC
6.1	Ephemeral	239	717	0.016
Totals =		239	717	0.016

Date: 6/15/2020 Revised: 4/16/2021



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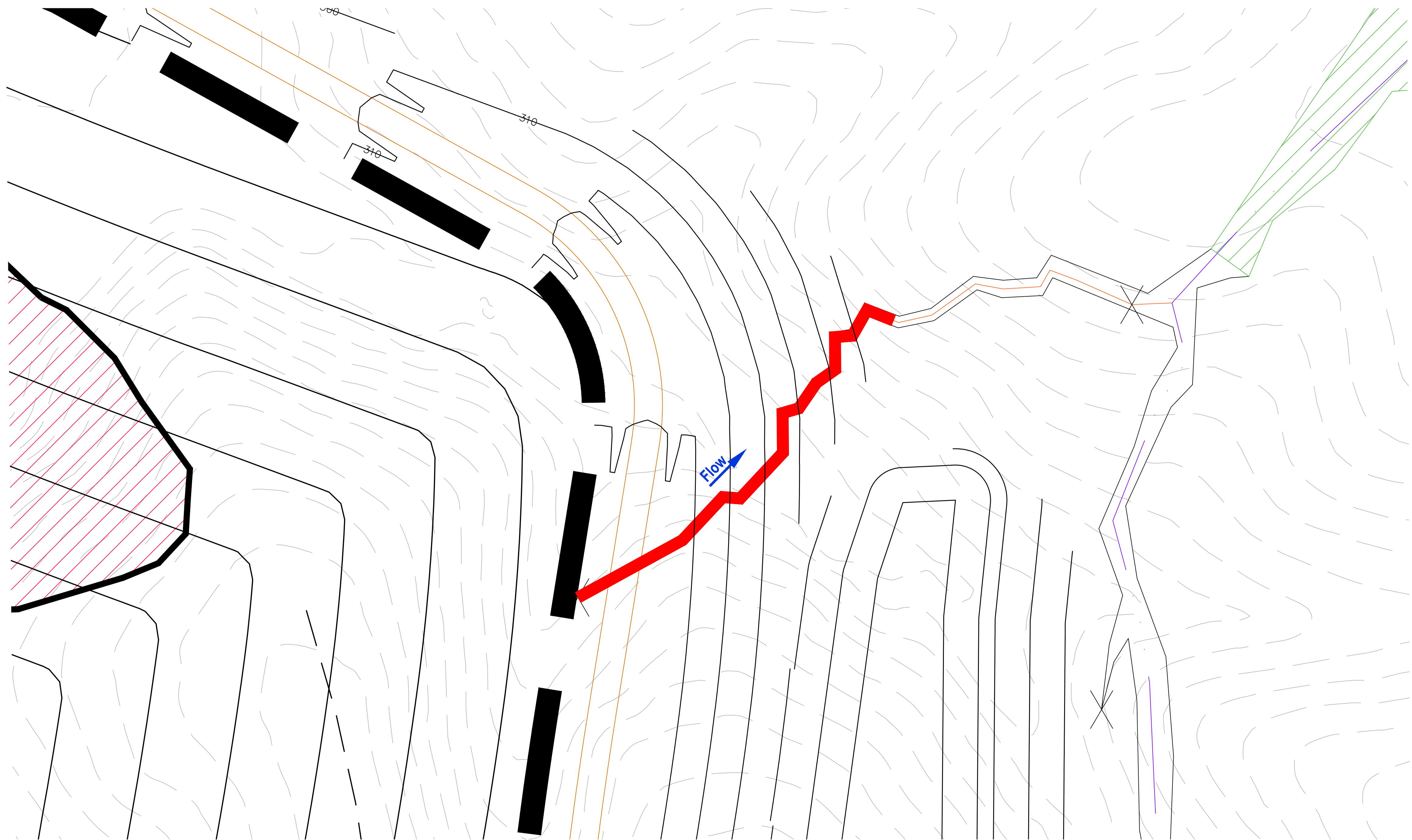
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BEJ	RWM	

**GREEN RIDGE RECYCLING AND
DISPOSAL CENTER**
CUMBERLAND COUNTY, VIRGINIA


STREAM REACH 6 IMPACTS


SCALE: 1"=50'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.6



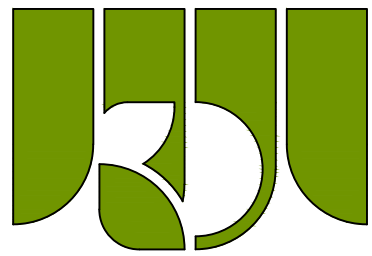
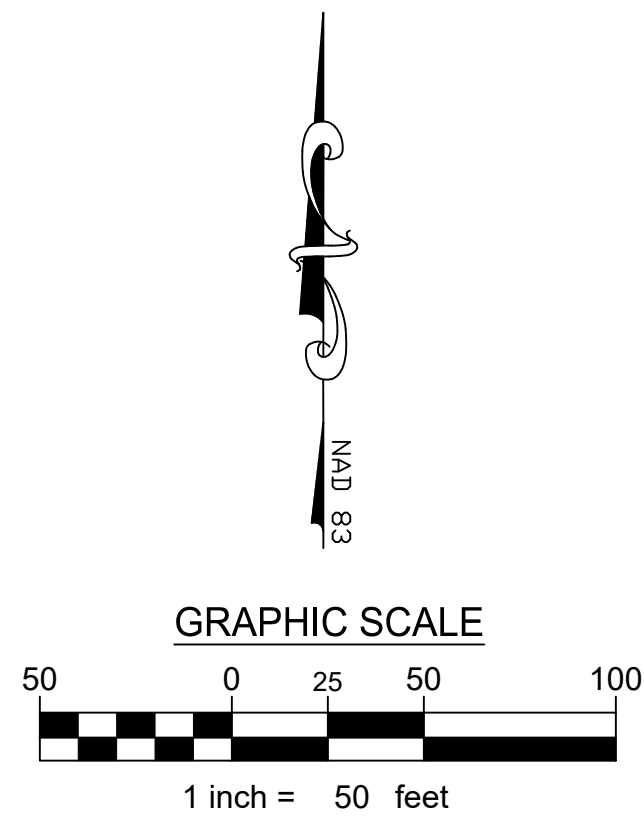
LEGEND:

Section 7.1 (Ephemeral) 

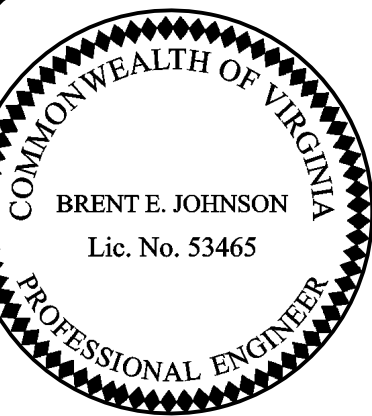
Direction of Flow 

Stream Impacts Calculations Stream Reach 7				
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas	
			SF	AC
7.1	Perennial	408	2,040	0.047
Totals =		408	2,040	0.047

Date Inserted: 6/16/2020 6:22



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REVISIONS		DESCRIPTION
NO.	DATE	REVISED PER CLIENT COMMENTS
1.	07/13/2020	REVISED PER CLIENT COMMENTS
2.	04/16/2021	REVISED PER CLIENT COMMENTS

POST APPROVAL

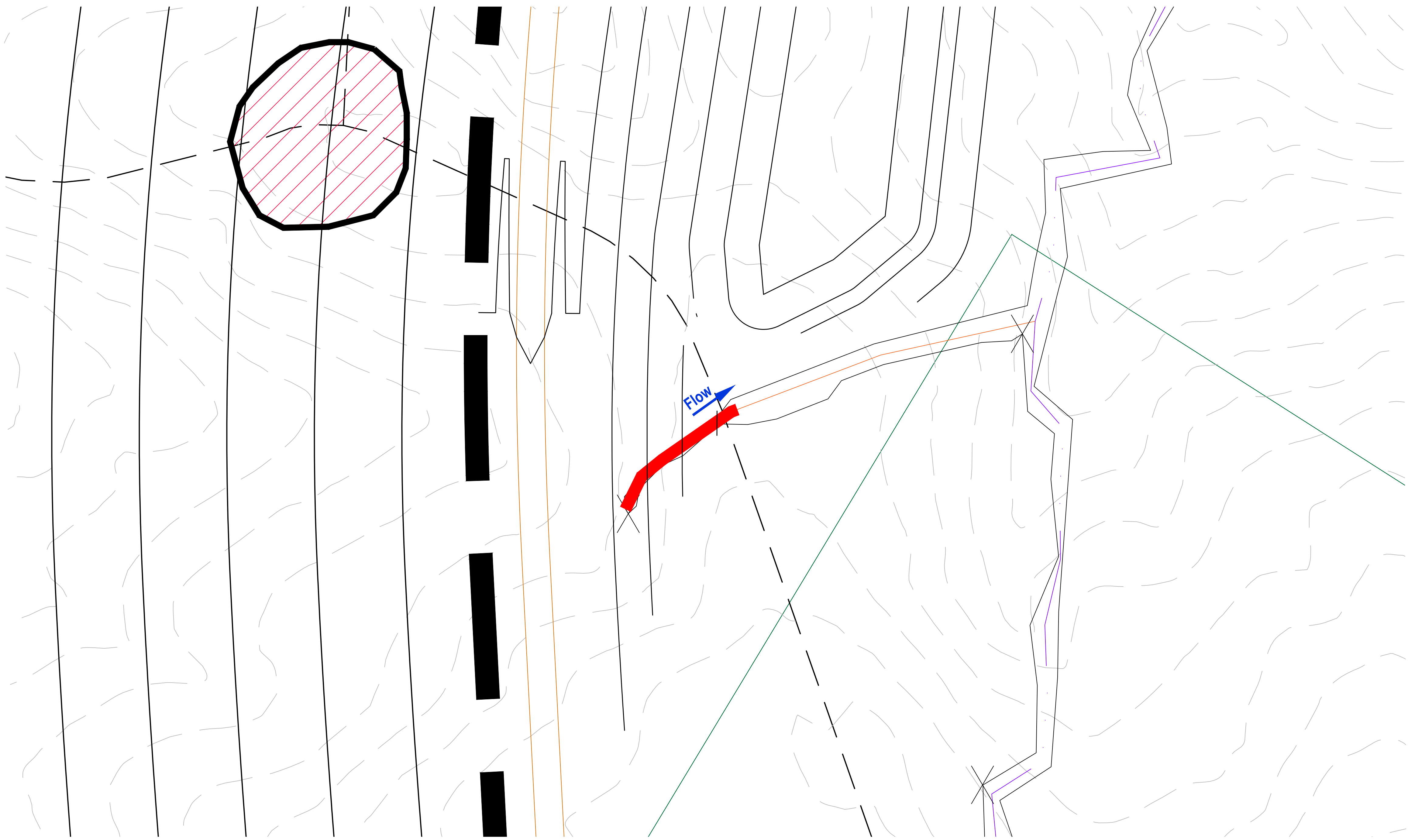
DESIGNED	DRAWN	CHECKED
BEJ	RWM	

**GREEN RIDGE RECYCLING AND
DISPOSAL CENTER**
CUMBERLAND COUNTY, VIRGINIA

STREAM REACH 7 IMPACTS

SCALE: 1"=50'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.7



LEGEND:

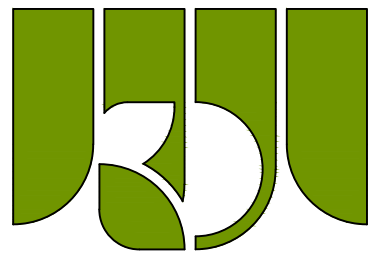
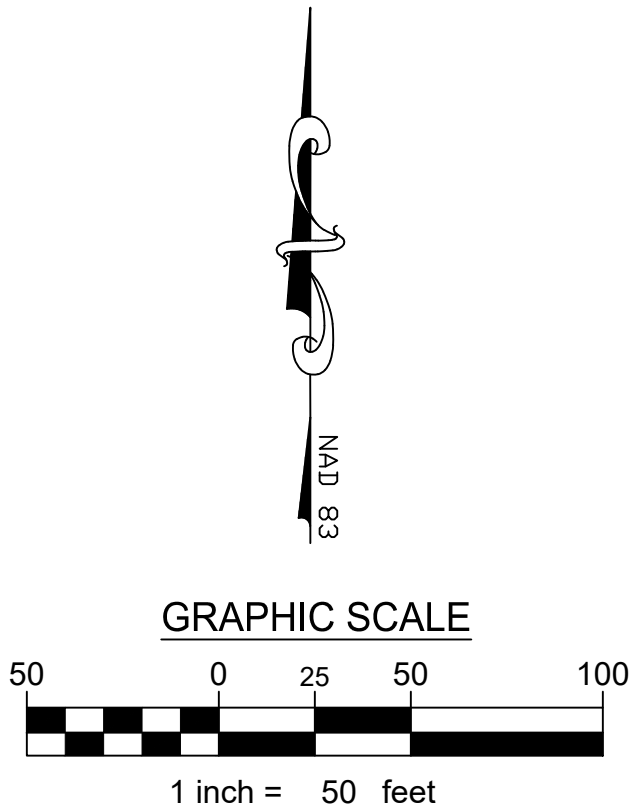
Section 8.1
(Ephemeral)

Direction
of Flow

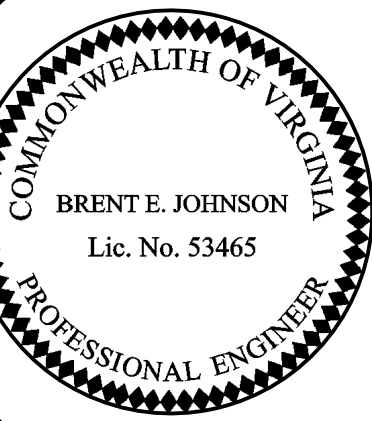
Stream Impacts Calculations					
Stream Reach 8					
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas		
			SF	AC	
8.1	Ephemeral	131	393	0.009	
Totals =		131	393	0.009	

Date: 6/15/2020

Revised: 4/16/2021



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REVISIONS		POST APPROVAL	
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DESIGNED		DRAWN	CHECKED
BEJ		RWM	

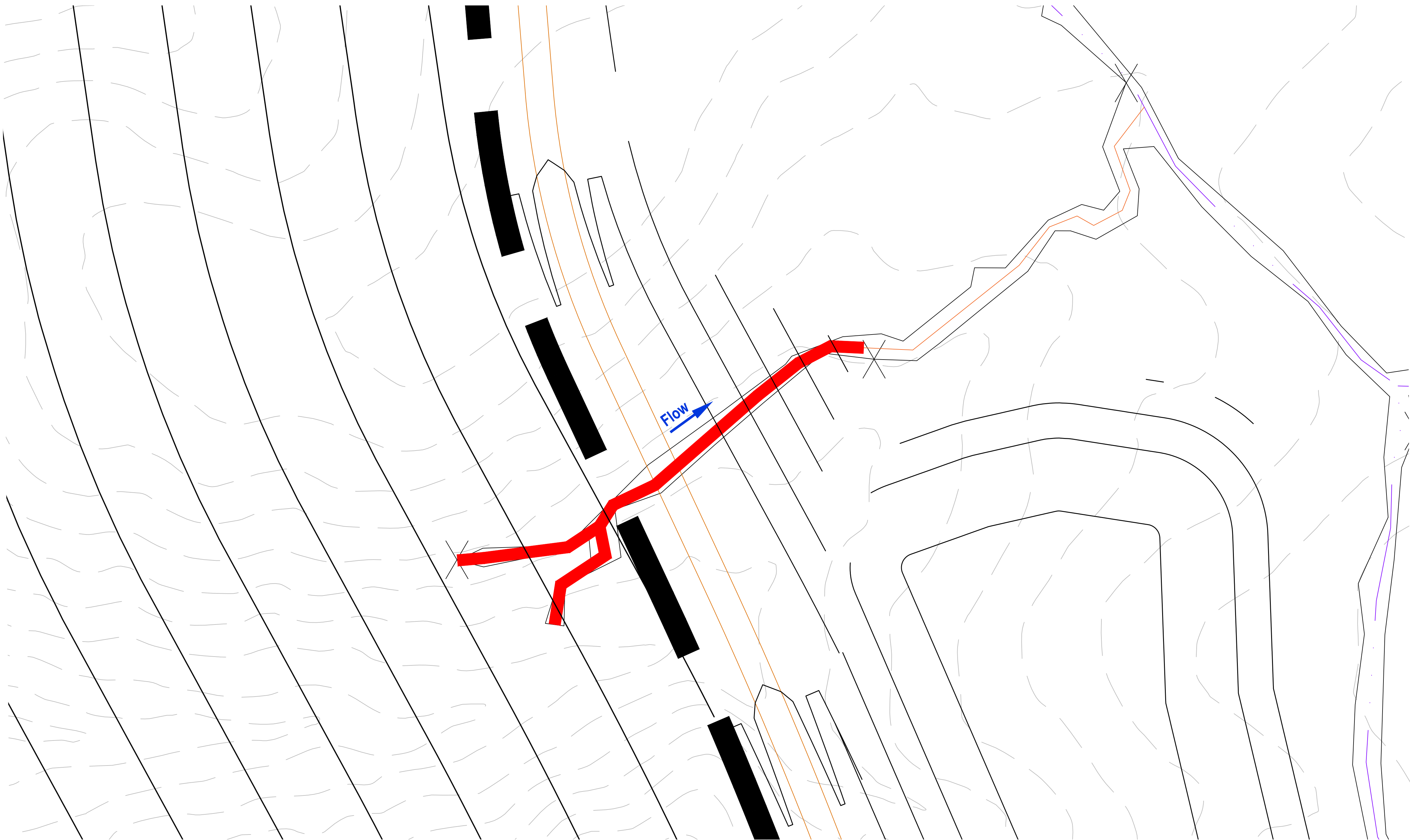
GREEN RIDGE RECYCLING AND
DISPOSAL CENTER

CUMBERLAND COUNTY, VIRGINIA


STREAM REACH 8 IMPACTS


SCALE: 1"=50'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.8



LEGEND:

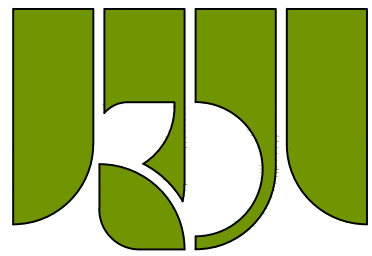
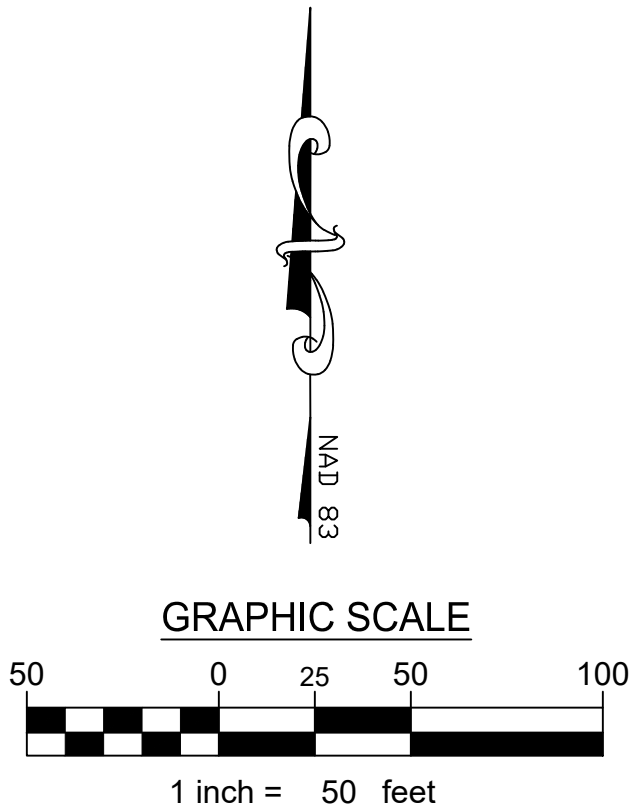
Section 9.1
(Ephemeral) 

Direction
of Flow 

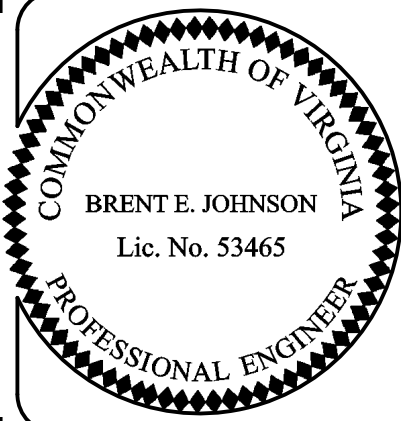
Stream Impacts Calculations Stream Reach 9				
Reach Segment ID	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas	
			SF	AC
9.1	Ephemeral	513	1,539	0.035
Totals =		513	1,539	0.035

Date: 6/15/2020

Revised: 4/16/2021



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REVISIONS		DESCRIPTION REVISED PER CLIENT COMMENTS REVISED PER CLIENT/COUNTY COMMENTS	POST APPROVAL
NO.	DATE		
1.	07/13/2020		
2.	04/16/2021		

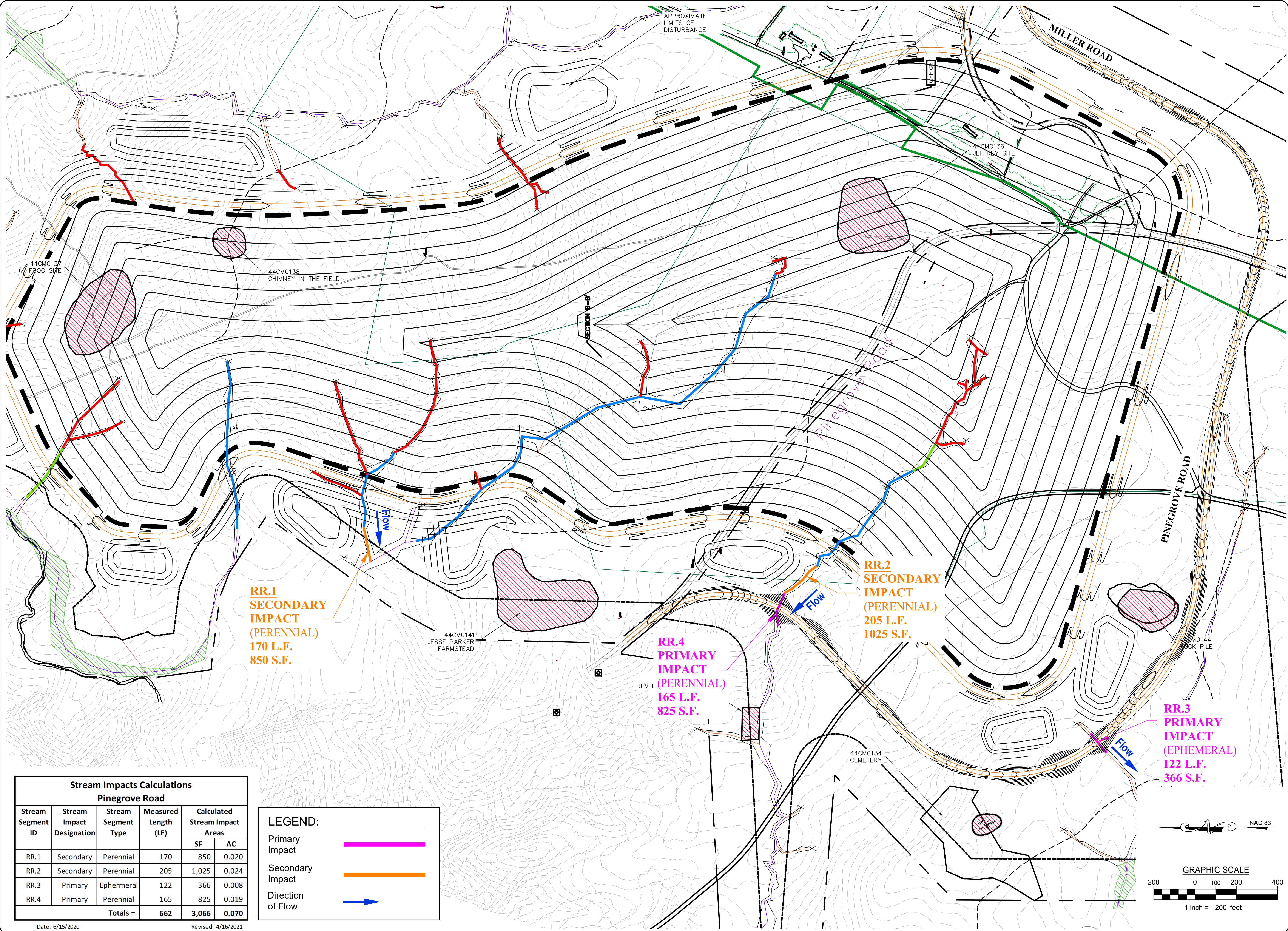
DESIGNED	DRAWN	CHECKED
BEJ	RWM	

**GREEN RIDGE RECYCLING AND
DISPOSAL CENTER**
CUMBERLAND COUNTY, VIRGINIA

STREAM REACH 9 IMPACTS

SCALE: 1"=50'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.9



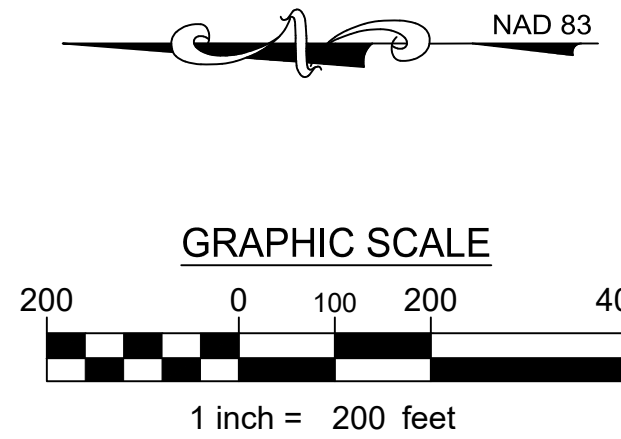
Stream Impacts Calculations Pinegrove Road						
Stream Segment ID	Stream Impact Designation	Stream Segment Type	Measured Length (LF)	Calculated Stream Impact Areas		
				SF	AC	
RR.1	Secondary	Perennial	170	850	0.020	
RR.2	Secondary	Perennial	205	1,025	0.024	
RR.3	Primary	Ephemeral	122	366	0.008	
RR.4	Primary	Perennial	165	825	0.019	
Totals =			662	3,066	0.070	

LEGEND:

Primary Impact

Secondary Impact

Direction of Flow



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COMMONWEALTH OF VIRGINIA
BRENT E. JOHNSON
Lic. No. 53465
PROFESSIONAL ENGINEER

NO.	DATE	REVISIONS	
		DESCRIPTION	REVISED PER CLIENT /COUNTY COMMENTS
1.	07/13/2020	REVISED PER CLIENT	COMMENTS
2.	04/16/2021	REVISED PER CLIENT	COMMENTS

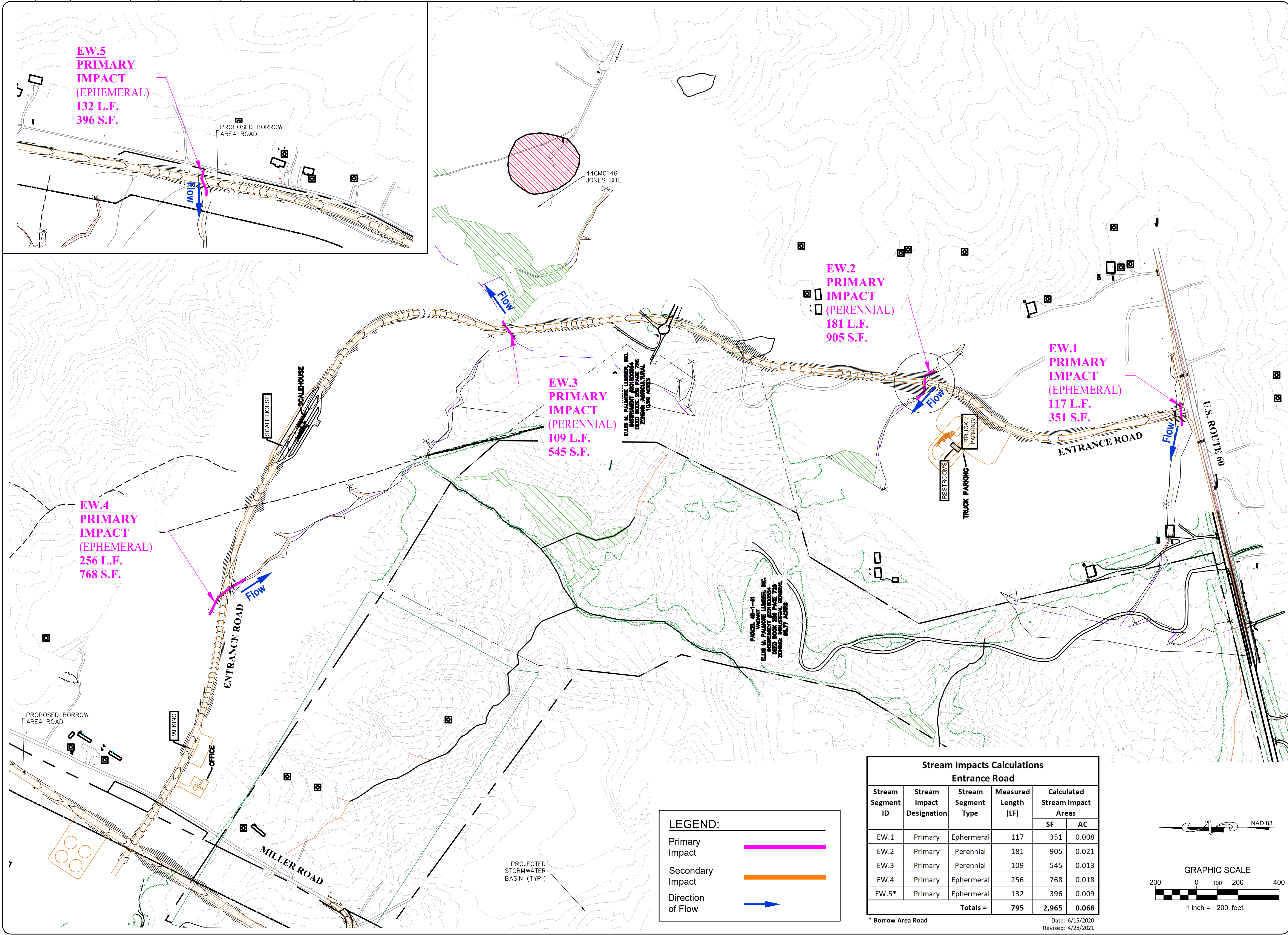
DESIGNED BEJ	DRAWN RWM	CHECKED
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GREEN RIDGE RECYCLING AND DISPOSAL CENTER
CUMBERLAND COUNTY, VIRGINIA

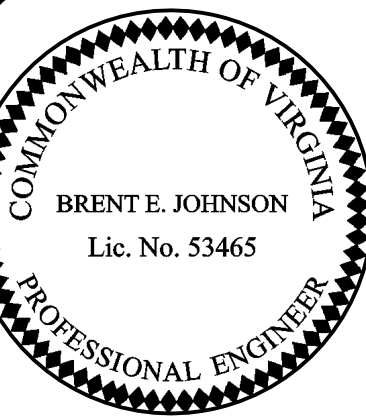
PINEGROVE ROAD IMPACTS MAP

SCALE: 1"=200'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.10



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2.	04/16/2021	REVISED PER CLIENT/COUNTY COMMENTS

DESIGNED	DRAWN	CHECKED
BEJ	RWM	

GREEN RIDGE RECYCLING AND DISPOSAL CENTER

CUMBERLAND COUNTY, VIRGINIA

ENTRANCE ROAD IMPACTS MAP

SCALE: 1"=200'
DATE: JULY 2, 2020
PROJECT: 2017-890

C1.11